

A REVISION OF THE ETHIOPIAN SPECIES  
OF THE TRIBE NOTIPHILINI  
(DIPTERA : EPHYDRIDAE)



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## SYNOPSIS

A revision of the Ethiopian species of the tribe Notiphilini is attempted. The diagnostic characters of the tribe are re-defined to enable the following genera to be included: *Notiphila* Fallén, *Paralimna* Loew, *Oedenops* Becker, *Karema* Cresson, and *Dryxo* Robineau-Desvoidy. Two subgenera, *Afrolimna* and *Oedenopiforma*, and twenty-six species are described as new. Lectotypes and paralectotypes are designated for *Notiphila ignobilis* Loew, and *Notiphila obscuricornis* Loew. *Paralimna pokuma* Cresson, *Paralimna mackieae* Cresson and *Paralimna adversa* Cresson, are re-instated as valid species. Particular emphasis has been placed on the structure of the male genitalia as a means of establishing species, and inter-generic relationships.

## INTRODUCTION

SINCE the publication by Cresson (1947) of his revision of the Ethiopian Notiphilini, numerous additional species have been described by Wirth (1955, 1956, 1960) and Soika (1956a, 1956b). Much additional material has been collected, or made available for study, and a combination of these factors will eventually necessitate a complete revision of the family in this region. It is to this end that I have attempted a revision of the tribe Notiphilini. This tribe, although consisting of only five genera, now contains a majority of the described Ethiopian Ephydrids.

Earlier work on Ethiopian Notiphilini was carried out by Loew (1862), Adams (1905), Bezzi (1908), and Becker (1903, 1923), all of whom described species in the genera under consideration in this paper, but as part of composite works on large collections of Ethiopian or North African Acalypterates.

The first Ephydrid specialist to work in a revisionary manner on material from the Ethiopian region, as here delimited, was Cresson, who over a number of years, published numerous papers concerned partly or wholly with the Notiphilinae and culminating in his aforementioned work, which was also unfortunately his last. In his 1947 paper Cresson established the generic limits of the tribe in Africa, but included only three genera, *Oedenops*, *Paralimna* and *Notiphila*. In this paper I have included two further genera, *Karema* and *Dryxo*, on the systematic position of which Cresson failed to pass an opinion, apart from suggesting the former as a link between *Paralimna* and *Dryxo* (1929).

In recent years Wirth (1955, 1956, 1960) has published further descriptions of new species and records of distribution in Southern and Eastern regions of Africa. Soika (1956*a*) described additional species from the Congo, suggested much synonymy, and keyed those species with which he was familiar. Soika (1956*b*, see Wirth 1960 : 391) briefly described further species from the Congo and the Malagasy sub-region.

For the purpose of this paper I have defined the Ethiopian region as including the mainland of Africa south of the Sahara, the Southern Arabian peninsula, the Malagasy sub-region and the Seychelles and associated islands. Those Palaeartic species recorded from the Sudan have been omitted.

The original material upon which this work has been carried out consisted of the large unidentified collections of the British Museum (Natural History) and many hundreds of specimens from the Belgian Congo, Madagascar, South, and West Africa.

Unless otherwise stated all the specimens are in the B.M.(N.H.). However, Congolese specimens are from the M.R.A.C. and the material collected by Dr. F. Keiser and Mr. B. R. Stuckenberg has been returned to N.M.B. and N.M. respectively.

#### ACKNOWLEDGMENTS

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To Dr. W. W. Wirth, United States National Museum (U.S.N.M.), I am most grateful both for his advice and for arranging for me to study material from the U.S.N.M., including collections sent to him by various collectors.

To the following my thanks are also due for supplying me with type specimens, or with special collections from specific areas of Africa: Dr. P. H. Arnaud, California Academy of Sciences (C.A.S.); Mr. J. C. Deeming, Institute for Agricultural Research, Samaru, N. Nigeria; Dr. F. Keiser, Naturhistorisches Museum Basel (N.M.B.); Dr. A. Kaltenbach, Naturhistorisches Museum Vienna (N.M.V.); Mr. J. M. Lyall, Amadu Bello University, N. Nigeria; Dr. S. S. Roback, Academy of Natural Sciences, Philadelphia, A.N.S.P.); Mr. P. I. Persson, Naturhistoriska Riksmuseet, Stockholm (N.R.S.); Dr. J. Verbeke, Institut Royal de Sciences Naturelles, Brussels (I.R.S.N.); and Dr. P. W. Wygodzinsky, American Museum of Natural History, New York (N.Y.).

## BIOLOGY AND ECOLOGY

To the present time there has been no published record of work upon the ecology or life histories of any of the five genera, from the Ethiopian region. Mr. B. R. Stuckenberg informs me (personal communication) and his observations are borne out by the limited information imparted by specimen data labels, that the adults of *Notiphila* are found on waterside vegetation, while those of *Paralimna* are mud dwellers. *Oedenops* appears to be restricted to vegetation bordering the littoral regions.

The elongated alimentary tracts of *Paralimna* and *Notiphila* are invariably full of microscopic sand and organic particles suggesting that, in the adults, feeding is confined to 'grazing' upon algae etc. on damp surfaces. Members of the genus *Notiphila* are often swept from growing rice but there appears to be no evidence to suggest that they are injurious to rice in this region.

## GENERIC RELATIONSHIPS

Of the five genera so far designated as belonging to this tribe, three, *Paralimna*, *Oedenops* and *Notiphila*, are easily placed here, unlike *Dryxo* and *Karema* which are associated on less obvious grounds. Similarity of form, with due regard to the reduced condition of the mesonotal setae, in *Karema* suggests a close relationship with *Paralimna*.

The members of the *Paralimna albonotata* species group have, more noticeably so in many oriental forms, considerable extension of the frons and facial region in the manner of *Karema* (Text-figs. 10, 39). Superficially, in colour and general habitus, *Karema* species resemble those of the new subgenus *Afrolimna* sgen. n. of *Paralimna*. The male genitalia are complex (Text-fig. 91) and the complex form of the hypandrium is unique in this tribe. The external claspers are attached to the epandrium and to sclerotized areas of the epandrial (paraproctal) membrane. The male genitalia are of little use in determining the relationship of this genus although basically of the Notiphiline type. Cresson (1929) considered this genus to be a connectant between *Paralimna* and *Dryxo*.

The placing of *Dryxo* in this tribe is far more a matter of conjecture, and in fact Cresson, apart from designating *Dryxo* as a member of the subfamily Notiphilinae, never commented upon the position of this genus. I consider it to be a highly specialized relative of this tribe, possibly requiring the erection of a separate tribe due to a number of distinctive characters, e.g. almost total absence of strong bristles on the head, flat projecting frons, only one centrally positioned notopleural bristle, and a series of long weak bristles on the basal ventral surface of the first long vein of the wing. An extrapolation of the condition found in *Karema* may explain all but the last of the characters mentioned.

The male genitalia of *Dryxo* are the strongest evidence for the inclusion of this genus in the tribe Notiphilini.

The external claspers in *D. ornata* are broad and rounded, not angular as in the subgenus *Paralimna* but bearing considerable resemblance to those of the subgenus *Afrolimna* sgen. n. *D. woodi* however, possesses more elongate external claspers

fused to a sclerotized region on the ventral edge of the paraproctal membrane, a condition similar to that found in *Karema*.

The genera *Paralimna* and *Oedenops* are very closely related and the subgenus *Oedenopiforma* subgen. n. of *Paralimna* provides the perfect connecting link. The only character in the species of the Ethiopian region which divides these two genera is the absence of sternopleural bristles in *Oedenops*. *Notiphila*, while without doubt a member of the tribe Notiphilini, is not as closely related to *Paralimna* as is *Oedenops*. It differs in frontal bristle arrangement and shortening of the costa, the latter extending only to the third long vein instead of the fourth. Cresson (1922) considered *Paralimna* more closely related, via the subgenus *Phaiosterna*, to the non-Ethiopian genus *Dichaeta*.

#### MALE GENITALIA

The male genitalia are consistent in basic structure between all five genera, differing only in degree of development of the component parts. The genus *Notiphila* possesses seemingly the most evolved and simple condition and the genus *Dryxo* the most structurally complex.

The individual condition in each genus will be described in the introduction to that genus.

The basic structure (Text-figs. 8, 9) consists of a strongly sclerotized epandrium partially or completely enclosing the paraproctal plates, proctigers or cerci, and the paraproctal membrane. The external claspers are attached to the ventral aspect of the epandrium and appear to differ in degree of development within a genus according to the size of the insects.

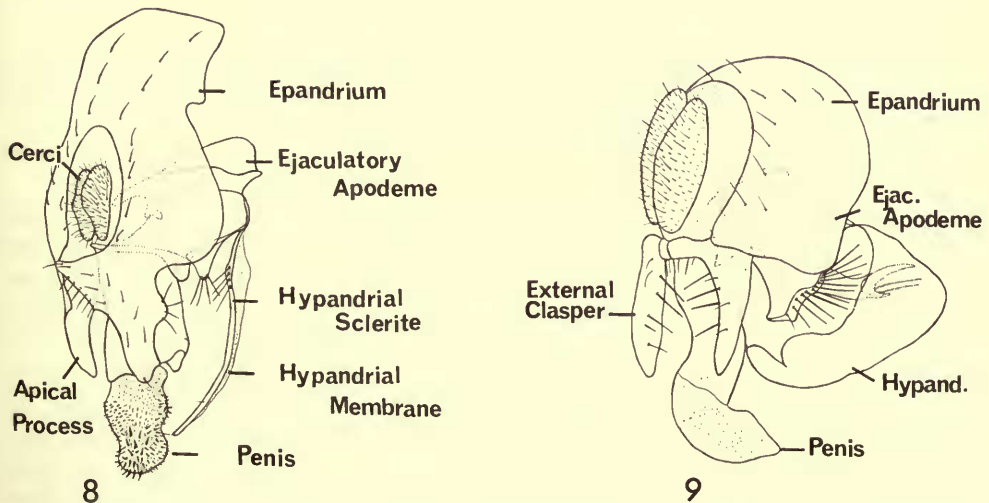
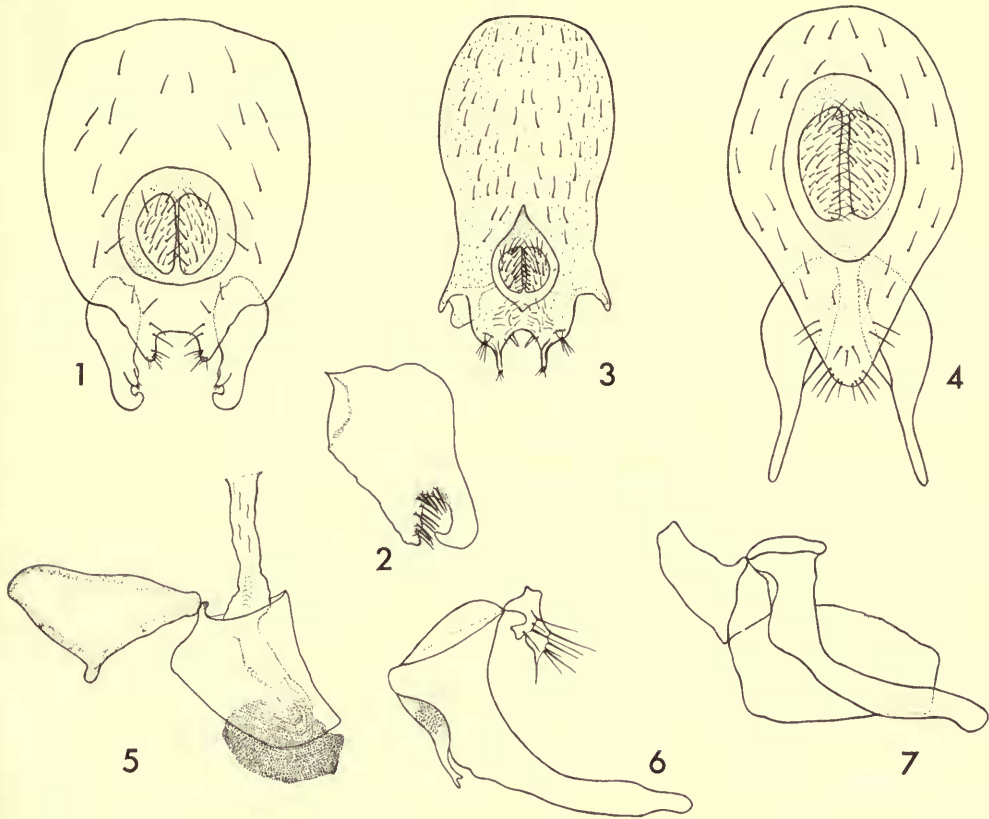
The hypandrium in all but *Karema* is a simple conical or sacklike structure usually only partially sclerotized, and in the latter condition supported by sclerotized rods. It is connected to the epandrium via the ejaculatory apodeme and to the aedeagus either directly to the phallobase or via the lateral parameres. The aedeagus consists of a sclerotized phallobase, a membranous, invariably extensible, penis, which may be armed with spinules, and lateral parameres or internal claspers which may be fused at their bases or free.

Accessory structures, differing appreciably in complexity between genera, are present and aid in holding the aedeagus free from the hypandrium and ensuring its rigid ejaculation.

The study of the male genitalia of all the Ethiopian species in the tribe Notiphilini, known from the male sex, has shown them to be consistent, if difficult, structures for the separation of species, providing that adequate critical observation is made upon all the parts of the genitalia.

#### COLOUR

Colour, in the members of the genera under consideration, is almost without exception due to the presence of a layer of 'pollen' or dust, of varying density, overlying the ground colour of the insect cuticle, the latter invariably black. Due to the variety of colours visible on slight alteration of the angle of the insect to the light source, the colours quoted are combinations representing the predominant



FIGS. 1-9. 1, 2, *Notiphila bipunctata* Loew, 1, epandrium; 2, external claspers; 3, *N. cana* Cresson, epandrium; 4, *N. lineata* Soika, epandrium; 5, 6, *N. bipunctata* Loew, 5, ejaculatory apodeme and aedeagus; 6, internal claspers, and hypandrial sclerite; 7, *N. lineata*, internal genitalia; 8, *N. pseudodimidiaticornis* Soika, ventrolateral view of ♂ genitalia; 9, *Paralimna arabica nubifer* Cresson, ventrolateral view of ♂ genitalia,

impressions obtained when the insect is observed at 90° to the surface. The use of the terms pale and dark are preferred in many instances, to more precise determinations, especially with reference to antennae and limbs, where strength of light source or degree of dusting may produce an infinite number of colour combinations.

### The Tribe **NOTIPHILINI** (after Cresson)

Small to large flies, eyes bare, lunule not developed above the region of antennal insertion. The ocellar bristles larger than the posterior ocellars, both may be absent in *Dryxo* R.D. Postnotopleural, when present, situated at ventral margin and weaker than anterior notopleural. Humeral and supra-alar bristles present. Mid tibiae with one to four usually erect dorsal spines, weak in *Oedinops*.

#### KEY TO ETHIOPIAN GENERA OF THE TRIBE NOTIPHILINI

1	Two notopleural bristles, dorsocentral bristles present . . . . .	2
-	One notopleural bristle, medially placed, <i>dc</i> absent . . . . .	4
2	Pre-sutural bristle and mesonotal setulae present . . . . .	3
-	Pre-sutural bristle usually absent, mesonotal setulae lacking <b>OEDENOPS</b> Becker p. 354	
3	Costa extending to third long vein . . . . .	<b>NOTIPHILA</b> Fallén pp. 286, 287
-	Costa extending to fourth long vein . . . . .	<b>PARALIMNA</b> Loew pp. 314, 324
4	Frontal and ocellar bristles strong . . . . .	<b>KAREMA</b> Cresson p. 356
-	Frontal and ocellar bristles weak or lacking . . . . .	<b>DRYXO</b> R.D. p. 358

### **NOTIPHILA** Fallén

*Notiphila* Fallén, 1813 : 22.

This genus contains, at present, twenty-three species from the Ethiopian region, including four endemic to the Malagasy sub-region. In comparison with the Palaearctic and Nearctic faunas this genus is poorly represented.

The twenty-three species in this genus are morphologically extremely similar. This fact, together with the variability of colouring, makes specific determination difficult, without recourse to genitalic differences.

The male genitalia, however, provide reliable characters for differentiating between even closely related species.

The genus *Notiphila* may be distinguished from the other members of the tribe Notiphilini by the following combination of characters: Costa extending only to the third long vein, sternopleuron with one large bristle, middle tibia with a dorsal row of at least three erect spinelike bristles. Notopleuron with two bristles, both situated close to the ventral edge, the anterior member slightly the stronger.

The male genitalia differ quite markedly between the two subgenera. That of the subgenus *Notiphila* (Text-fig. 8) has greatly reduced external claspers, which are fused almost completely to the ventral edge of the epandrium, acting as supports for the ventral extensions of the epandrium. The latter structures probably function as claspers. The internal claspers are reduced but the membranous penis is usually armed in some way with spinules.

The male genitalia of the subgenus *Agrolimna* Cresson (Text-figs. 4, 7) possesses



well developed and free external claspers, well developed internal claspers, and an unarmed penis. The hypandrium is virtually without sclerotized supports.

There is considerably more variation in the structure of the genitalia in the subgenus *Notiphila* than in the subgenus *Agrolimna*.

Subgenus **NOTIPHILA** Fallén

Type-species, *N. cinerea* Fallén, 1810 (Westwood, 1840 : 153).

Restricted by Cresson (1917) and containing those species possessing the following combination of characters :

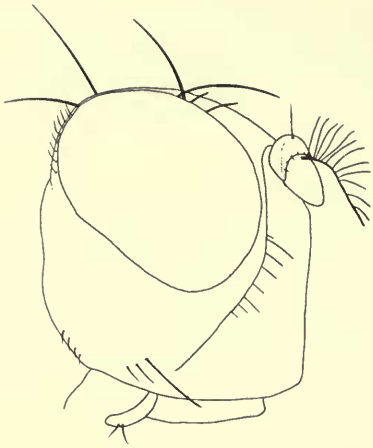
Facial series of bristles few in number, strong, and usually inserted ventral to the lower level of the eye (Text-fig. 13). Middle tibia with three dorsal, erect spines. Hind metatarsus with black basal scopa. Male mid femur with a comb of short curved setae on the ventral face. Male genitalia with external claspers fused to the ventral edge of the epandrium.

Containing the majority and most specifically distinct of *Notiphila* species, the male genitalia exhibiting considerable variation in epandrial form. Facial bristle number and arrangement, together with variety of colour, length and arrangement of hind basal scopa and flexor comb are invaluable diagnostic characters for specific differentiation.

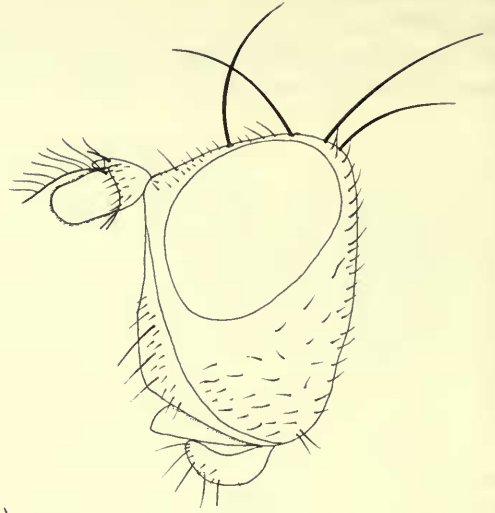
One of the species, that I have placed in this subgenus, *N. (N). irrorata* sp. n. bears close resemblance to an oriental species, *N. dorsopunctata* Wied., the latter species being assigned to a distinct subgenus, *Notiphilacantha* Hendel, by Cresson (1948 : 16). Study of the male genitalia of *N. dorsopunctata* Wied., shows no outstanding differentiating characters which warrant the use of the subgenus *Notiphilacantha* for species from this region.

KEY TO THE ETHIOPIAN SPECIES OF *NOTIPHILA*

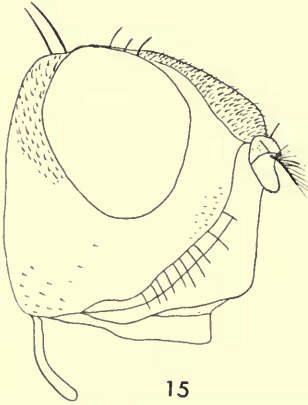
- |   |   |   |    |
|---|---|---|----|
| 1 | Hind metatarsal basal scopa consisting of yellow or pale brown setae, mid tibiae with four dorsal erect bristles; facial series reduced and hairlike. Mid femora of male without a ventral 'comb' . . . . .   | sgen. <b>AGROLIMNA</b> Cresson (p. 305) | 15 |
| - | Hind metatarsal scopa of black setae, mid tibiae with three dorsal erect bristles; facial series usually of strong bristles. Mid femora of male with a ventral comb of short closely inserted setae . . . . .   | sgen. <b>NOTIPHILA</b> Fallén           | 2  |
| 2 | Hind metatarsus with a brush of dense yellow to golden brown hairs along at least part of the posteroventral face of segment . . . . .  |   | 5  |
| - | Hind metatarsus with black hairs or small bristles along complete posteroventral face of segment . . . . .  |   | 3  |
| 3 | Bristles of facial series weaker than frontal bristles, widely separated, two in number, ventrally inserted on face; male epandrium (Text-fig. 25) with elongate narrow projections. Antennae black . . . . .   | <b>lunicornis</b> Soika (p. 301)        |    |
| - | Bristles of facial series usually as strong as, or only slightly weaker than frontal bristles, three in number, more closely set, almost meeting in median line. Male epandrium (Text-figs. 18, 23) with ventral projections as broad as long. Antennae predominantly pale . . . . .                          |   | 4  |
| 4 | Bristles of facial series strong, porrect. Face yellow in colour. Thorax generally cinereous, often totally so. Abdominal brown fasciae usually in two median broad vittae with only partial lateral extension on to anterior half of the segments. Male aedeagus with distinct strong black spines . . . . . | <b>ignobilis</b> Loew (p. 303)          |    |



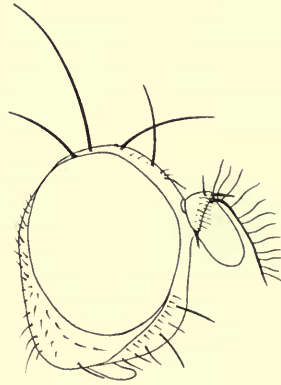
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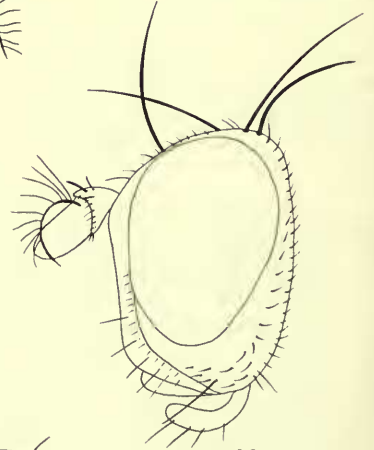
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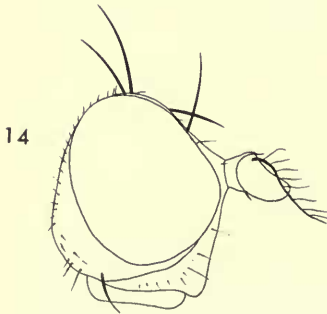
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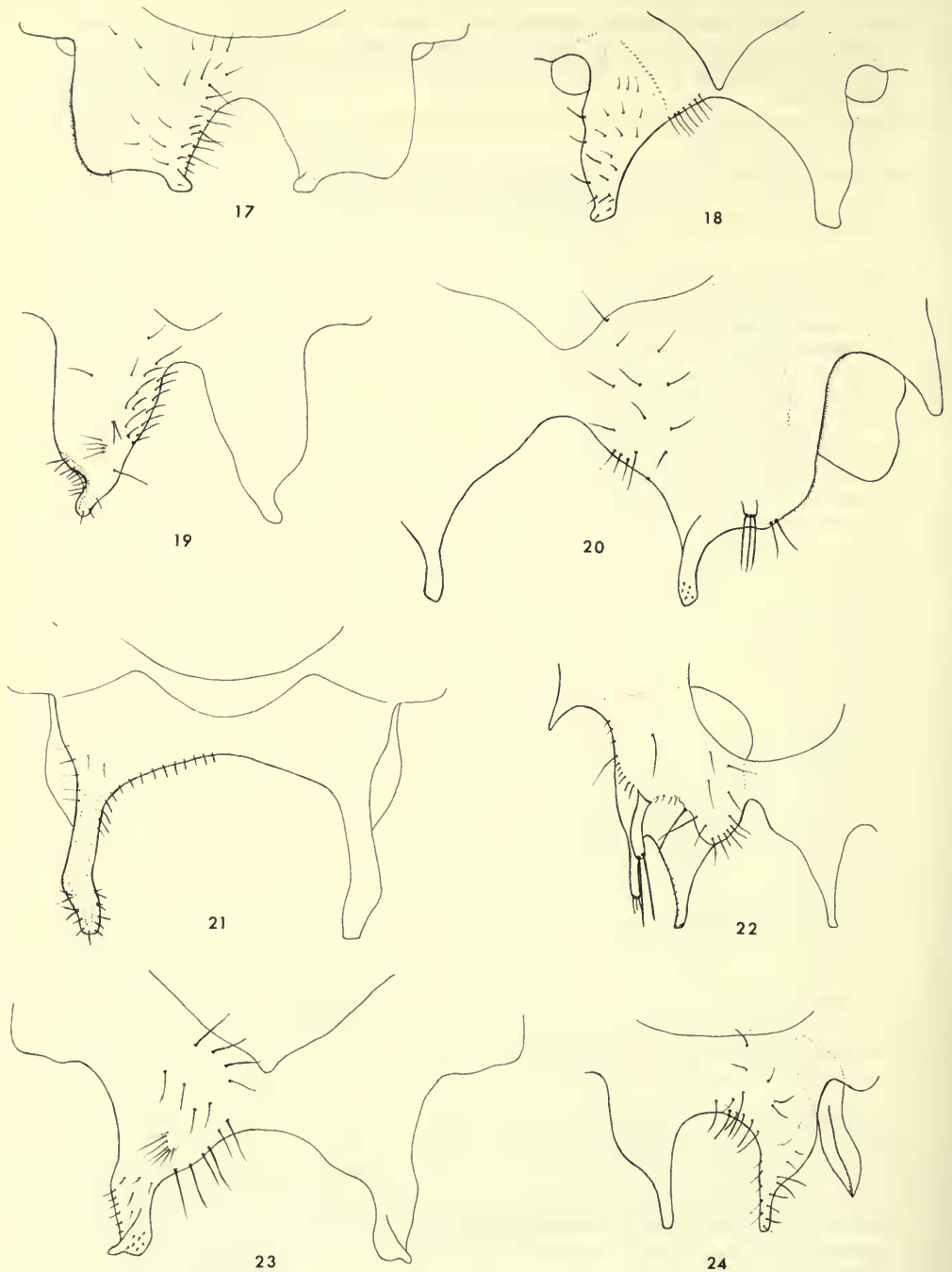
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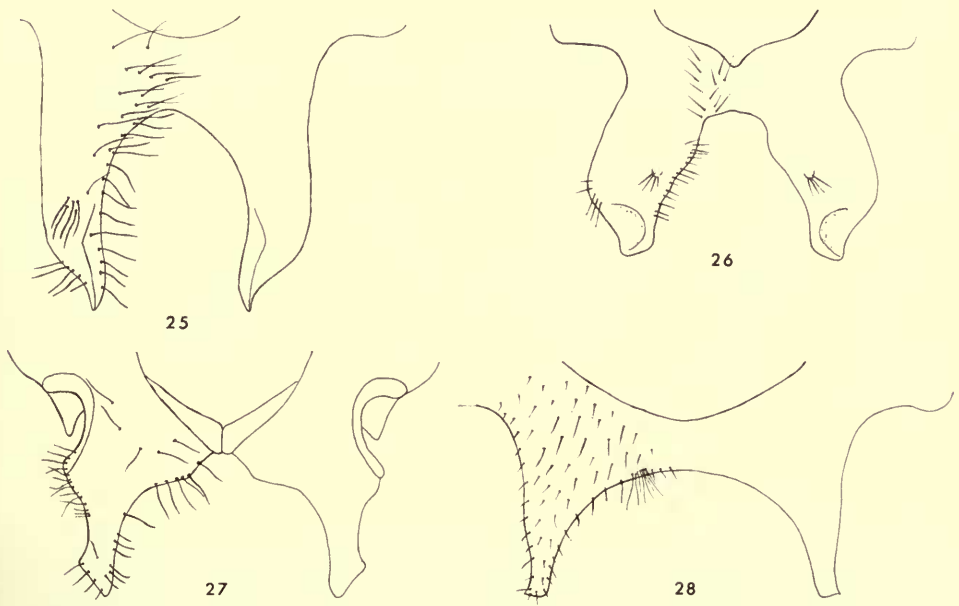
FIGS. 10-16. Heads of: 10, *Karema flavipes* sp. n.; 11 *Notiphila omercooperi* sp. n.; 12, *N. kenyaensis* Cresson; 13, *N. stuckenbergi* sp. n.; 14, *N. bivittata* sp. n.; 15, *Dryxo margaretae* sp. n.; 16, *Oedenops aurantiacus* Soika.

- Bristles of facial series slightly weaker than frontals, less porrect. Face greyish yellow in colour, antennae dark with pale base to segment III. Brown fasciae of abdomen extending over majority of segments. Male aedeagus without strong black spines . . . . . *lyalli* sp. n. (p. 297)
- 5 Bristles of facial series as strong, or almost as strong, as the equivalent length of tips of the frontal bristles . . . . . 6
- Bristles of facial series weak, appreciably weaker than frontals . . . . . 10
- 6 Hind metatarsal brush yellow along complete length of segment. Fore femur without a series of outstanding bristles on the posteroventral face. Face silver-white  
*cana* Cresson (p. 292)
- Hind metatarsal brush dark along at least part of the length, thorax and abdomen never predominantly cinereous. Fore femora with a posteroventral series of bristles . . . . . 7
- 7 Posteroventral series of fore femoral bristles as strong as facials. Face yellow with or without central carina darkened, a large species . . . . . *pokuma* Cresson (p. 294)
- Posteroventral series of fore femoral bristles not as strong as facials . . . . . 8
- 8 Thorax cinereous, mesonotal setae arising from brown markings. Male epandrium with two additional ventral projections . . . . . *irrorata* sp. n. (p. 292)
- Thorax predominantly brown, setae may or may not arise from irrorations . . . . . 9
- 9 Antennae totally reddish brown or with at the most the apical third of segment III darkened, face and frons a uniform dark golden brown, facial series set ventrally on face the most dorsal arising just below the lower level of the eye. Wings infumated . . . . . *fuscofacies* sp. n. (p. 296)
- Antennae totally dark or with base of antennal segment III pale. Face golden yellow, facial series set slightly above lower level of the eye and with supernumary bristle-like hairs around facial series . . . . . *frigidicola* sp. n. (p. 295)
- 10 Face almost vertical, epistoma either retracted or in same line as lower face. Eyes small, width of buccae equal at narrowest point, at least to half height of eye (Text-fig. 11) . . . . . 11
- Face more concave, epistoma posterior to line of lower face, latter often curved laterally at ventral rim. Eyes large in relation to size of head, width of buccae much less than half height of eye (Text-fig. 13) . . . . . 14
- 11 Hind metatarsus with dense pale golden yellow hair along complete posteroventral or inner face of segment, although anterior or outer face may be darkened along all or part of its length. Face golden yellow . . . . . 12
- Hind metatarsus with dense pale yellow hair along only part, usually basal third, of inner face; face grey . . . . . 13
- 12 Eyes longer along horizontal axis, antennae totally dark, and occipital region with two grey patches which extend on to the vertex on either side of the ocellar triangle  
*omercooperi* sp. n. (p. 299)
- Eyes longest along vertical axis, occipital region without the grey patches  
*pseudobscuricornis* Soika (p. 302)
- 13 Hind metatarsal basal scopa consisting of two or three very short bristles, shorter than width of segment. Facial series long, extending over half height of face  
*microscopa* sp. n. (p. 298)
- Hind metatarsal basal scopa consisting of three bristles at least twice as long as width of segment. Facial series short, of two to three bristles  
*pseudodimidiatricornis* Soika (p. 301)
- 14 Facial series of three to four bristles with the dorsal penultimate bristle lacking or reduced to a short hair. Antennal segments I and II and basal two thirds of segment III pale. Brown abdominal fasciae large and covering majority of segment . . . . . *stuckenbergi* sp. n. (p. 363)
- Facial series of two to three short, weak bristles in complete series. Antennal segments I and II dark, III pale. Brown abdominal fasciae reduced to patches  
*swarabica* sp. n. (p. 302)



FIGS. 17-28. Apical epandrial processes of *Notiphila* spp.: 17, *N. ignobilis* Loew; 18, *N. lyalli* sp. n.; 19, *N. frigidicola* sp. n.; 20, *N. cana* Cresson; 21, *N. omercooperi* sp. n.; 22, *N. irrorata* sp. n.; 23, *N. pokuma* Cresson; 24, *N. stuckenbergi* sp. n.; 25, *N. lunicornis* Soika; 26, *N. fuscifacies* sp. n.; 27, *N. pseudodimidiaticornis* Soika; 28, *N. pseudobscuricornis* Soika.

- 15 Frons and/or vertex with velvety black patches or lateral bands . . . . . 16  
 — Neither frons nor vertex with velvety black patches or lateral bands
- obscuricornis* species-group** 17
- 16 Antennal segments I and II and majority of III pale, two large round velvety black patches on vertex, wings with veins strongly infumated
- bipunctata*** Loew (p. 306)
- Antenna black, lateral thirds of frons and vertex velvety black, median third bluish grey . . . . . ***bivittata*** sp. n. (p. 312)
- 17 Antennae totally black or with very narrow pale strip at base of segment III . . . . . 18  
 — Antennae with at least basal third of segment III pale . . . . . 20
- 18 Front tibiae dark, mesonotum with narrow brown vittae, quite distinct against lighter brown ground colour. Male epandrium with ventral apical process mucronate (Text-fig. 29) . . . . . ***montana*** sp. n. (p. 309)
- Front tibiae pale basally for one third the length, mesonotum and frons dark brown vittae indistinct or lacking. Male epandrium with ventral apical process roundly truncate (Text-figs. 30, 31) . . . . . 19
- 19 Mesonotal vittae totally lacking, face usually yellow, male epandrium as in Text-fig. 30 . . . . . ***kenyaensis*** Cresson (p. 307)
- Mesonotal vittae present, face grey, male epandrium as in Text-figure 31
- obscuricornis*** Loew (p. 306)
- 20 Fore tibia with at least basal third and apex pale . . . . . 21  
 — Fore tibia almost totally dark or with at least apex dark . . . . . 22
- 21 Fore tibia with at least half of length dark dusted . . . . . ***lineata*** Soika (p. 309)
- Fore tibia with only slight dark dusting . . . . . ***andrana*** sp. n. (p. 308)
- 22 Male epandrium with apical process truncate, median abdominal vitta narrow and constricted by brown fasciae . . . . . 23  
 — Male epandrium broadly rounded apically, external claspers with a pronounced lateral expansion. Abdominal vitta broader and continuous
- dimidiaticornis*** Soika (p. 310)



FIGS. 25-28.<sup>1</sup>

<sup>1</sup> Legends opposite

- 23 Face silver-grey, with the carina darkened in lower half; male epandrium narrowly truncate apically (Text-fig. 33). Mesonotal vittae distinct . . . *kufena* sp. n. (p. 311)
- Face grey or white, carina unmarked; male epandrium truncate with terminal lateral protuberances bearing numerous setae . . . . . 24
- 24 Face matt grey, antennae with basal third of segment III pale; male epandrium broadly truncate (Text-fig. 32) . . . . . *abdita* sp. n. (p. 312)
- Face silver-grey, pleurae dark brown, wings infumated; male epandrium narrowly truncate apically (Text-fig. 36) . . . . . *ambata* sp. n. (p. 313)

*Notiphila (Notiphila) cana* Cresson

(Text-figs. 3, 20.)

*Notiphila cana* Cresson, 1947 : 23.

To the brief description of the damaged type may be added the following diagnostic characters. Antennal segment III pale smoky in apical half. Eight to ten lateral hairs to the arista, base pale, the majority dark. One relatively strong divergent anterior fronto-orbital. A row of dense short bristles on the ventral surface of the first tarsal segment. Very weak bristling on the fore femora. Male ventral femoral fringe relatively weak, bristles only about equal to one third the width of the femur. A large species, up to 5 mm.

Hind metatarsus with four black spines to scopa and pale yellow pile along the length of the segment interspersed with stronger pale orange brown bristles.

General body colour cinereous with pale yellow legs, strongly grey dusted on femora and tibiae. Abdomen with a pair of very faint pale brown vittae on segments three, four and five. Male genitalia as Text-figs. 3 and 20.

Variation. The type from the Congo has considerably more brown on the notum than the majority of specimens I have seen, particularly those from the east of the Congo.

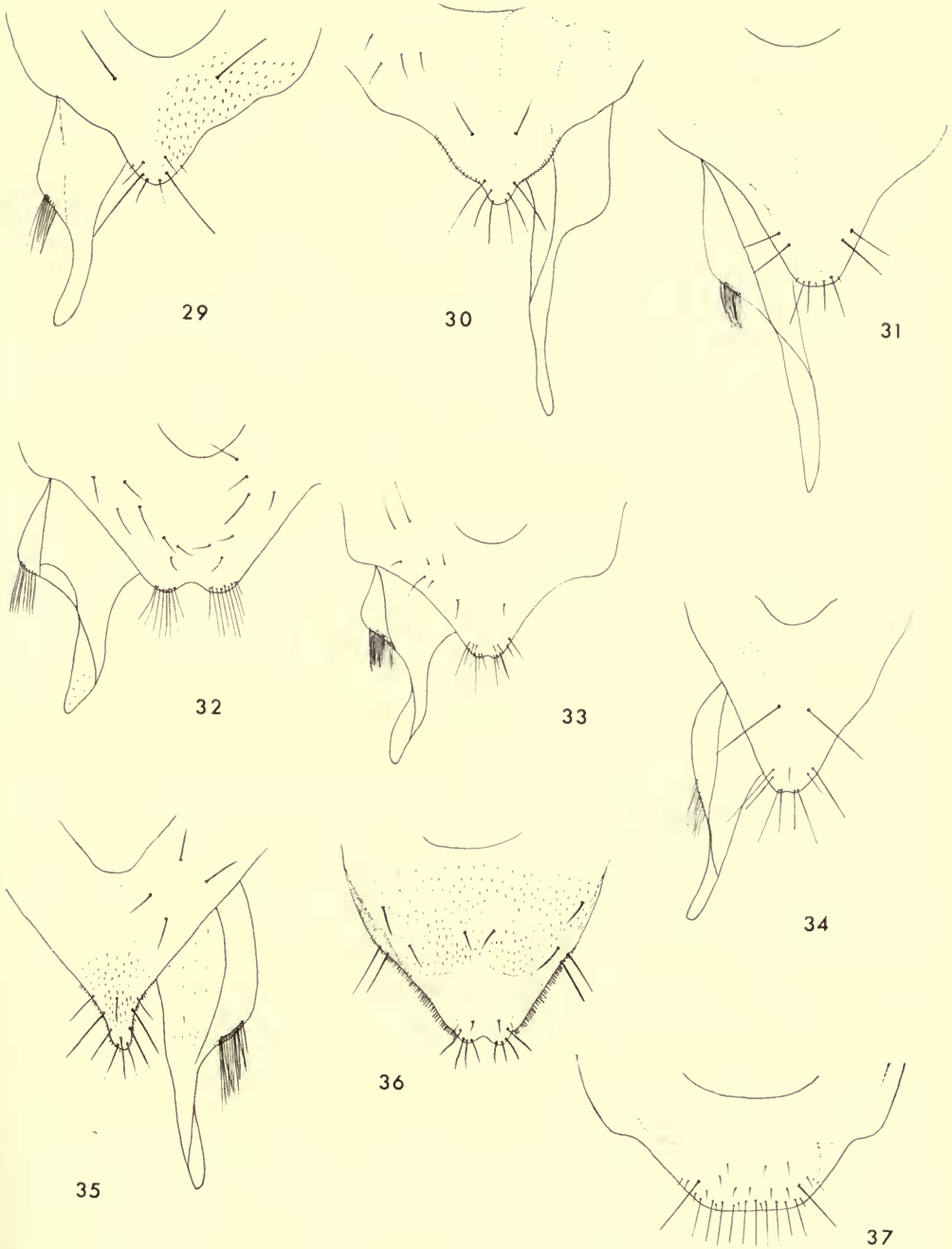
The pale pile on the hind metatarsus is reduced in some specimens and two specimens from Tanganyika have noticeably smaller eyes. Specimens from Nigeria have darker antennae, more vittate brown mesonotal markings extending on to the scutellum. The abdominal vittae are marked and broad. It is most closely related to *N. irrorata* sp. n.

Material studied. UGANDA: Sere Teso, 5 ♂, 3 ♀, iv.35 (*J. Ford*). TANGANYIKA: Ukiriguru, 1 ♂, 19.ix.58 (*I. A. D. Robertson*), on cotton; Tanga, at light, 1 ♀, 30.iv-I.v.1953 (*L. F. Brown*); Ukiriguru, 1 ♀, 12.ii.59 (*I. A. D. Robertson*), Light trap. ZAMBIA: Near lake Bangweulu, N'Salushi Island, 1 ♀, 13.xi.1946 (*M. Steele*). NIGERIA: Zaria, Samaru, 1 ♂, 1.iv.1966 (*J. C. Deeming*), M.V. trap; Zaria, Samaru, 1 ♀, 9.viii.1966 (*J. C. Deeming*), M.V. trap. MADAGASCAR: Maj. Ambovovy, 1 ♂, 30.vi.1953 (*F. Keiser*); Maroantsetra, Ambodivoangy, iii.1952 (*R.P.*) Institute Scientifique Madagascar.

*Notiphila (Notiphila) irrorata* sp. n.

(Text-fig. 22)

A distinctive species, with an easily determinable character in the irrorations of the thorax. Every bristle arises from a dark brown patch of irregular outline. The thoracic vestiture is almost totally cinereous.



FIGS. 29-37. Apical epandrial processes of *Notiphila*, at least one external clasper removed: 29, *N. montana* sp. n.; 30, *N. kenyaensis* Cresson; 31, *N. obscuricornis* Loew; 32, *N. abdita* sp. n.; 33, *N. kufena* sp. n.; 34, *N. lineata* Soika; 35, *N. andrana* sp. n.; 36, *N. ambata* sp. n.; 37, *N. dimidiaticornis* Soika.

♂. *Head*: antennae totally pale orange-yellow, with a very slight darkening of the tip of segment III. The arista has thirteen lateral hairs. The face, buccae and fronto-orbital strips are of a dull greyish yellow. The facials are very strong and curved, almost meeting in the midline, three in number with two shorter, much weaker bristles below. The buccal bristle is of the same size and strength as the longest facial. Numerous small hairs are set around and dorsal to the facial series. Two long, slightly subequal posterior buccal bristles. The last member of the posterior orbital series is long, two thirds outer vertical bristle, inclinate and almost meeting medianly.

*Thorax*: ground colour cinereous, with very light brown dusting on mesonotum. Base of all bristles brown, very slight on notopleural and humeral, very broadly so around the dorso-centrals. A single rectangular brown patch in centre of mesopleuron.

*Wings*: with membrane lightly infumated.

*Legs*. All legs pale, apart from grey dusted femora and slight darkening of apical tarsi. Fore femur with a series of seven to eight long, rather weak, bristles on postero-ventral face. Male 'comb' on mid femur well developed but bristles closely set and short. Hind metatarsal scopa of four, three short and one long, black bristles on pale yellow brush of hairs extending only over basal half of segment.

*Abdomen*: greyish green ground colour with two brown vittae and two broken bands of brown, lateral to them, on segments three and four. There are numerous small setae arising from small brown irrorations.

There are a number of specimens of this species in the collection of the I.R.S.A.C. Museum from the Congo, which apart from small differences in colour of mesonotum, which is darker, and less infumation of the wings, are identical with those of the type series. Due to their poor condition I have not included them as paratypes.

This discontinuous distribution is of considerable interest and suggests a very wide tolerance of climatic conditions.

The genitalia are very distinctive (Text-fig. 22) with two extra ventral projections in addition to the fused external claspers.

Holotype ♂. W. ADEN PROT.: Kirsh, c. 3,000 ft., 22.iii.1940 (*P. W. R. Petrie*), Aden Prot. Medical Survey, 'in bushes near water hole'. B.M.(N.H.).

Paratypes. 3 ♀, same data. B.M.(N.H.).

CONGO specimens—not paratypes. Kivu, Kavimvira (Uvira) à la lumière, 8 ♂, 12 ♀, i. 1956 (*G. Marlier*); Rutshuru, 2 ♂, II.v.36 (*L. Lippens*).

### *Notiphila (Notiphila) pokuma* Cresson

(Text-fig. 23)

*Notiphila pokuma* Cresson, 1947 : 121.

*Notiphila pokuma* Cresson; Soika, 1956 : 501.

A large distinctive species easily distinguished from *Notiphila ignobilis* and *Notiphila cana*, which it resembles in body form, by the very strong facials, large size, long arista, darker colouring and the long bristles on the fore femora.

It is characterized by three large strongly curved facial bristles, plus a number of small bristles ventral to this series, almost totally pale antennae with an arista bearing up to fifteen lateral hairs. Three to five long bristles, twice the width of the femur, posteroventrally situated on the fore femora, and a variable series on the posterior face. Series of five to six strong



bristles on anteroventral surface of mid femur. Hind metatarsus with black scopa on yellow background setae, the latter extending only over the basal half of the segment.

Large broad epandrium, ventral external claspers with short reflexed tip (Text-fig. 23), hypandrial sclerites with small rayed expansion at the apices.

Variation: considerable variation in size and colour of facial carina occurs, deep brown in West African material but completely absent in Malagasy and most East African specimens. Reduced to a pale brown spot in central and some Eastern specimens.

Material studied. Holotype. SIERRA LEONE: Pokuma, ♀, 3.ii.25, river bank (*E. Hargreaves*). MADAGASCAR: Fia, Mananjary, 1 ♀, 7.viii.58 (*F. Keiser*). NIGERIA: Zaria, Kufena, 2 ♂, 2 ♀, 14.2.66 (*J. M. Lyall*). CONGO: Elizabethville, 1 ♂, 11.ix.1931 (*A. Mackie*). KENYA: Nairobi, 1 ♀, vii.1930 (*V. G. L. van Someren*); Nyeri (S.), 1 ♂, x.48 (*V. G. L. van Someren*). GHANA: Ashanti, Obuasi, 1 ♂, 1.ix.1907 (*W. M. Graham*), caught on mud in swamp; Ashanti, Obuasi, 1 ♂, 15.iv.06 (*W. M. Graham*). KENYA: Mt. Elgon, 1 ♀, xi.1935 (*F. W. Edwards*), Exp. Kapreteva, 6,500 ft. CONGO: Kivu, Kavimvira (Uvira), 39 ex., xii.1954 to i.1956 (*G. Marlier*) à la lumière; Ruanda, L. Karago, 1 ex., 21.iii.36 (*L. Lippens*); Kibali, Ituri, Kilomires, 1 ex., 10.iii.56 (*R. P. C. Smoor*); Elizabethville, 1 ex., 9.iii.49 (*C. Seydel*) à la lumière; Rutshuru, 1 ex., ix-x.1936 (*Delville*); Kamosobe (Sud Masisi), 7 ex., 4.iii.36 (*L. Lippens*); Rutshuru, 1 ex., 27.iv.36 (*L. Lippens*); Nyangwe, 1 ex., 4.v.1918 (*R. Mayne*). UGANDA: Entebbe, 1 ex., viii.59 (*P. L. G. Benoit*).

### *Notiphila (Notiphila) frigidicola* sp. n.

(Text-fig. 19)

♂. *Head*: antennae black with small reddish area at base of segment III and the apex of segment II. Arista black with eleven lateral hairs. Face golden with three long, curved, very strong facial bristles, the anterior pair meeting in the mid line. No smaller bristles, but a lateral series of hairs extends from the buccal edge to the point where the parafacials meet the frons. Parafacials golden grading to grey on the buccae. Buccal bristle as long as, but weaker than facials. Two subequal posterior buccal bristles. The short bristles on buccae, in lines extending to buccal edge and then in two rows to region of verticals. Palpi creamy white, with weak hairs on the lower portion of the exterior face. One relatively long, about one sixth the length of the fronto-orbitals, anterior 'fronto-orbital'. The most posterior vertical bristle long and meeting in the mid line. Frons with numerous small hairs on the lower third and five to six short orbital hairs. Frons with pale orbital strips, and a darker band delimiting the ocellar area. A pale region around the ocelli leading in a narrow band to the edge of the frons. Cheeks broad.

*Thorax*: normal setation arising from brown markings, plus numerous mesonotal and scutellar setulae. Pleura and mesonotum basically cinereous with heavy brown dusting on the majority of the mesonotum and mesopleuron. Sternopleuron with two instead of one large bristle in type male. Wings hyaline, slightly yellowish, with pale veins. Costa strongly spined and with two long bristles before humeral break. With three spines, two short and one long, in the plane of the wing and numerous short spines along the first section of the costa, leading to a larger spine just before the break, set at an angle of 60° to the plane of the wing on the dorsal face. Hind cross-vein concave and last section of the fifth long vein strong to the wing edge, very slight clouding around this area.

*Legs*. Fore leg: femur and coxa grey, latter with hairs over complete surface. Femur with five bristles, not very strong, on the posterior ventral series, longest equals the width of the

femur. Four strong bristles in posterior series. Tibiae and tarsi pale but the latter appearing darker due to numerous dark hairs and some dusting. Mid leg: femur grey dusted with one strong spine in apical half on the anterior face, the usual strong male fringe, yellow knees and pale tarsi. Hind leg: femur grey with two strong spines on the apical one third of the anterior face, tibiae pale. Metatarsus with scopa of three black spines on pale hairs extending over only one third of the segment. Tarsi pale.

*Abdomen*: cinereous, strongly patterned with brown, strong bristles on the posterior edge of the last three segments. The brown markings almost totally delimiting the central cinereous vitta.

Length: 4.5–5 mm.

♀. Slightly stronger setation of the legs, more dark brown on the mesonotum and pleura, and the pale area of the hind basal scopa extending over half of the metatarsal segment. The wing costal bristles are weaker.

There is one specimen, which I believe to be of this species, but due to colour differences is not included among the paratypes.

Closely related to *Notiphila ignobilis* but differing in a number of ways; hind metatarsal comb basally yellow, generally darker, antennae largely so, and male genitalia with much elongated ventral processes (Text-fig. 19).

Holotype ♂. MADAGASCAR: Centre, Lac Froid, Dct. Ambotolampy, 11–15.xii. 57 (*B. Stuckenberg*), 1602 m.

Paratypes, topotypical, 2 ♂, 12 ♀. One other specimen not considered to be a paratype.

Holotype to the Natal Museum, plus 1 ♂ and 9 ♀ paratypes; 1 ♂ and 3 ♀ paratypes to the B.M.(N.H.).

### *Notiphila (Notiphila) fuscofacies* sp. n.

(Text-fig. 26)

Very similar to previous species but face, frons and mesonotum, an unicolourous dark brown. Wings slightly infumated.

♂. *Head*: arista with ten lateral hairs, segments I, II, and III all pale but segment III with dark pubescences resulting in a sombre tinge, especially to apical two thirds. Ventral hairs on second segment a little more than one third the length of the third segment. Face golden brown, extending only to facial suture laterally, parafacial region buff grading to grey on buccal and posterior buccal regions. Facials of three strong curved bristles, the distance between their apices equal to half the length of the bristle, ventral to the strong bristles are a series of three small weak bristles. Facial series ventrally inserted on face, most dorsal only just above line of base of eye. Numerous short weak hairs, together with bristles, on raised lateral facial pads, the hairs extending from the lower facial angle to the lower fronto-orbital angle. Palps pale yellow in colour, sparingly haired. Long buccal bristle about one third width of the head. Buccal bristles relatively long and erect, basally in four to five irregular rows, becoming two rows dorsally. The two strong posterior buccal bristles ventrally directed, twice as long as surrounding bristles and only just subequal. The four or five bristles surrounding the main buccal bristle are anteriorly directed and one and a half times the length of the remainder.

Frons very uniform in colour, dark brown tinged with golden brown, and with iridescent shades of green when viewed at an angle. Frons divided by an indistinct band of lighter brown arising from the ocellar protuberance. Lower frons with numerous small hairs, orbital

plates with seven to eight small hairs, one of which is relatively strong. Inner verticals longer than height of head, outer verticals two fifths length of inner; false posterior verticals crossing just before their tips. Final bristle of posterior orbital series twice the length of the penultimate.

*Thorax*: majority of mesonotum uniform dark brown with light gold dusting, central region between dorsocentrals with two indistinct lighter vittae on either side of a median brown band. The humeral angle and extension to the side of the notopleuron plus the non-bristled, most anterior portion of the thorax, greenish buff. The only other such region is a narrow area close to the supra-alar bristles. A normal complement of bristles on the mesonotum. Meso-pleuron pale buff-brown with an indistinct central brown patch extending to stigma. The most dorsal bristle of the posterior series is weak and directed dorsally, the second less than half the third, two weak hairs between the latter and the ventral edge. Pteropleuron with dark brown patches. Sternopleuron and metapleuron olive-grey. Scutellum, when viewed from the posterior aspect, paler than mesonotum due to yellow-gold dusting, being most dense between apical bristles and giving rise to a pale yellow area. Disc and lateral areas covered with weak hairs, a pair of which are inserted between apical and basal bristles and stronger than the remainder.

*Legs*: all femora dark, usually strongly silvered, trochanters, tibiae and tarsi pale. Fore legs, minispines on ventral edge of femora extending over apical two thirds, fringe of hairs along complete edge. Six outer, posteroventral bristles equal at their longest to a little in excess of width of femur. Metatarsal brush dark. Mid femur with series of four developed bristles on anterior face, two well developed. Posteroventral 'comb' present. Tibia with three erect dorsal spines. Hind femur with one strong pre-apical, anteroventral bristle. Metatarsal comb strong, black and one and a half to twice the width of metatarsus in length, short, about one third of metatarsal length, area of dense golden yellow brush on internal face of metatarsus.

*Wings*: only slight infumation, especially of costal edge. Basicosta with long bristles and three extra long and strong bristles, one just before humeral break. First section of costa with spines and long hairs, ending in three spines, one large spine, in plane of wing, plus a shorter spine preceding it, and one short spine set dorsally from the costal edge at an angle of 45 degrees. Second and third sections of costa with spines and ventral hairs one and a half times length of spines. Second section greater than twice length of third. Hind cross vein almost straight. Haltere with pale yellow club and slightly reddish base.

*Abdomen*: abdominal pattern with brown fasciae broken into dark brown isolated areas, median olive-buff vitta extending the length of the abdomen. Long bristles on posterior edges of segments four and part of three arising from brown irrorations. Bristles of posterior edge of fourth segment not extending beyond fifth segment. Brown central fasciae just attaining the posterior edge of segments, two, three and four. Male genitalia as Text-fig. 26.

♀. 11-13 hairs on arista. Palpi darker.

Holotype ♂. MADAGASCAR: Centre, Moramanga, 1,000 m., 18-24.xii.57 (*B. Stuckenberg*), N.M.

Paratypes. MADAGASCAR: Centre, Moramanga, 1,000 m., 4 ♂, 3 ♀, 18-24.xii.57 (*B. Stuckenberg*); Tananarive, Tsimbazaza. 1 ♀, i.49, (*R.P.*) Institute Scientifique, Madagascar. 'Sur riz'.

### *Notiphila (Notiphila) lyalli* sp. n.

(Text-fig. 18)

This species is very closely related to *Notiphila ignobilis* but may be distinguished by the following characters.

Smaller size generally. Facial colour greyish yellow, facials shorter and more slender. Thoracic pattern more pronounced and generally darker and more intense. Abdominal pattern

far bolder with dark brown fascia covering the majority of the abdominal segments. Central pale vitta narrow widening on last segment. Legs generally darker and male fringe on mid femur less pronounced.

♂ genitalia: aedeagus without the strong spines present in *Notiphila ignobilis*, epandrial processes as in Text-fig. 18.

This species is named after the collector, Mr. J. M. Lyall, who is at present engaged upon ecological research on this and related species.

Type and paratypes to B.M.(N.H.), five female and five male paratypes to collector. One male, not made a paratype, very heavily coated with golden brown pollen on frons and mesonotum.

Holotype ♂. NIGERIA: Zaria, Kufena, 15.vi.66 (*J. M. Lyall*) to B.M.(N.H.).

Paratypes. NIGERIA: Zaria, Samaru, 1 ♀, 16.ii.66 (*J. C. Deeming*), Irrigation ditch; Zaria, Kufena ponds, 2 ♂, 2 ♀, 30.iii.66 (*J. C. Deeming*); Zaria, Kufena ponds, 1 ♂, 12.iii.66 (*J. C. Deeming*); Zaria, Kufena, 9 ♂, 11 ♀, 15.vi.66 (*J. M. Lyall*); Zaria, Kufena, 2 ♂, 2 ♀, 4 ii.66 (*J. M. Lyall*). CONGO: Kasongo, 3 ♂, 1 ♀, viii.59 (*P. L. G. Benoit*); Kasongo, 1 ♂, ix.59 (*P. L. G. Benoit*); Rutshura, 1 ♀, ix-x.1936 (*Delville*).

Not paratypes. CONGO: Uele; Gangala na Bodio, 1 ex., 14.v.36 (*L. Lippens*); 6 ex., 15.v.36 (*L. Lippens*); 1 ex., 15.iv.36 (*L. Lippens*); Kasongo, rive du Lualaba, 1 ex., viii.59 (*P. L. G. Benoit*); Nyangwe, 3 ex., 4.v.1918 (*R. Mayne*); Haut-Uele: Paulis, 1 ex., iv.1947 (*P. L. G. Benoit*); Komi, Lodja, 1 ex., i.1930 (*V. Ghesquière*); Elizabethville, 1 ex., 16.xii.50 (*C. Seydel*) à la lumière; Rutshuru, 3 ex., ix-x.36 (*Deville*); Terr. Rutshuru, 1 ex., vii.137 (Mission Prophylactique); Kasongo, 1 ex., viii.59 (*P. L. G. Benoit*).

### *Notiphila (Notiphila) microscopa* sp. n.

Closely allied to species *N. omercooperi* sp. n., but lacking the grey patches on the vertex. The posteroventral spines on the fore femur longer and more hairlike, and the hind flexor scopa is extremely small, varying from a half to slightly less of the width of the metatarsus.

♂. *Head*: antennae black, arista dark and short with eight lateral hairs and just less than twice the length of the third segment. Face pale silver-grey with slight yellow undertones. The facial series is long, consisting of six, fairly weak and short bristles not strongly curved, with two or three of the hairs on the pads above facial bristles strengthened and equal to the facials, seemingly extending the series almost to the antennal foveae. Up to fifteen extra hairs set in parallel series to the facials. Carina weak and totally flat in the lower half of the face. Palpi orange-yellow, with numerous short hairs along the ventral edge of the palps. Buccae strongly yellowed. Buccal bristle equal in length to the facials. Posterior buccae with numerous small bristles, the lower edge with bristles slightly longer than those on the anterior edge. The longest posterior buccae are about two thirds of the buccal in length. The second posterior buccal is about two thirds of the longer one. Vertex and occiput are paler than the frons. Frons matt, orange-brown, divided medianly by a narrow pale stripe from the ocellar triangle. Anterior frons is covered with a short erect sparse pile. The two orbital strips are chocolate-brown when viewed at an angle to the light. One para-orbital

relatively well developed, reclinate and outward pointing. Other head bristles are of normal proportions.

*Thorax*: mesonotum similar in colour to frons but with appreciably more olive-green dusting. Small setulae evenly scattered over the surface, those between the dorsocentrals not modified as acrostichals. The scutellum is of similar colouring but with fewer scattered hairs. The pleura gradually grade ventrally and posteriorly from an orange-brown on the mesopleuron and pteropleuron, to a paler olive-green or grey on the sternopleuron and metapleuron.

*Wings*: long, 2.6 times as long as wide. Costal index equals 2.5. The hind cross vein is straight, the wings are hyaline and the veins light brown. Ventral costal hairs are not obvious.

*Legs*: fore coxae with scattered hairs which are short over the lower two thirds. The femur is grey dusted. The posterodorsal series five to six in number, short and weak. The posteroventral series long, greater than or equal to the width of femur. Tibiae and tarsi pale, except last segment of latter, which is dark, broad, greater than penultimate. Mid coxa and femur grey dusted, one large pre-apical bristle on the anterior face of femur. Male femoral comb strong over the apical two thirds. Tibiae with three dorsal erect spines, plus a ventral pair of apical subequal larger spines, and four smaller. Tarsi pale with the last segment dark. Hind femur and coxa grey dusted, tibia pale; apart from the last segment the tarsi are also pale. Metatarsus with the thick pale pile over the basal third and the comb of two short spines, each less than the width of the metatarsus in length. The pale pile extends along the complete inner edge.

*Abdomen*: the first segment pale grey, other segments brown and grey. The pattern is very diffuse and on segments two and three the brown pattern is limited to the anterior two thirds, but the segments get progressively darker posteriorly. The last segment almost totally brown. There is a median grey vitta.

The female differs from the male in having the body colour either more green or grey, in one specimen golden pollen obscures the mesonotal pattern. The facials are less strong and the arista has a variable number of lateral hairs, from six to ten. The pale pile on the hind metatarsus may be less than a quarter of the length of the segment.

The frons of one specimen has an almost purple tinge when viewed at an angle to the light.

This is a distinct species, similar in external form to *Notiphila omercooperi* sp. n. and to *Notiphila pseudobscuricornis* Soika, but may be distinguished from either by the facial series, facial colour and size of the hind basal scopa of the posterior metatarsus, and from the former by the hind basal scopa, fore femoral posteroventral series which is spinose in *Notiphila omercooperi* and long and hairlike in this species.

Holotype ♂. ABYSSINIA: Wouramboulchi, Serpent Lake, c. 9,000 ft., 5.x.1926 (*J. Omer-Cooper*), to B.M.(N.H.).

Paratypes. 1 ♂, 11 ♀, same data as type.

### *Notiphila (Notiphilia) omercooperi* sp. n.

(Text-figs. 11, 21)

A good distinct species bearing most resemblance to *Notiphila kenyaensis*, but of course in the other subgenus as shown by the hind basal scopa and genitalia of male (Text-fig. 21).

The grey punctations on the vertex, the matt brown mesonotum and frons with velvety brown orbital strips, the narrow eyes and narrow hind basal scopa of metatarsus will distinguish this species from any other. Bristles on fore femora shorter and spinose, long and hairlike in *Notiphila microscopa*.

♂. *Head*: antennae totally black, segment III with pale pubescence, imparting a light golden hue to the segment when viewed at an angle to light. Arista black, short, with seven lateral hairs and less than twice the length of the third segment. Face golden yellow, the central carina round and prominent, due to the deeply excavated antennal fossae. Facial series of bristles weak, situated on short raised pads, consisting of three long curved bristles and two lower shorter bristles. Epistoma grey, palps orange-yellow, with numerous short hairs scattered over the external surfaces. Cheeks and buccae golden, similar to face, buccal bristle and the most anterior of the buccal hairs long. Two short, slightly subequal, stout, postbuccal bristles. Buccal hairs small and decumbent. The frons golden brown with green overtones, when viewed at an angle to the light. Dark strip divides the frons into two halves, orbital strip golden to chocolate-brown. Narrow orbital strip of a similar colour but extending beyond the fronto-orbital bristle to the anterior fronto-orbital angle. Vertex with two large pale grey areas extending from the mid occipital region to the level of posterior ocelli, on either side of the ocellar triangle. Remainder of vertex dark brown. Fronto-orbital bristle in length equal to outer vertical. Eyes narrow, horizontally inclined and elongate, cheeks broad, wider than vertical width of eye.

*Thorax*: mesonotum a uniform matt orange-brown with pale green dusting. Numerous small hairs are scattered over the mesonotum, those between the dosocentrals not developed as distinct acrostichals. Scutellum of similar colour to the mesonotum, the tip is covered with long pale hairs. Two or three prescutellar hairs are stronger than the rest. Mesopleuron and pteropleuron brown with a grey area on the lower, anterior third. Dorsal mesopleural equal half the ventral mesopleural. Hairs ventral to the bristles only a little stronger than general mesopleural hairs. Remainder of the pleura grey.

*Legs*: fore coxae grey with short hairs over all but the basal quarter. Trochanter grey, femur, tibia and tarsi darker dusted. Posteroventral series of bristles eight in number, short and stout and greater than the width of the femur in length. Last tarsal segment broad, greater than the penultimate at apex, with one long hair inserted dorsally and two shorter hairs on either side. Lateral ventral apical bristles on all tarsal segments equal to the width of the segment in length or slightly greater. Mid coxa and femur grey-brown dusted, mid-anterior series of bristles three in number, all strong and shorter than width of femur. Anteroventral series well developed and curved (secondary male character). Femur grey dusted at base. Tibiae with dark dusting on greyish background dusting. Pulvilli large and conspicuous on all legs. Mid tibial apical crown of spines consisting of two ventral subequal spines and four lateral small spines. Tarsi pale with dark dusting. Hind coxae dark, femur grey dusted at base, darker apically. One stronger bristle on the apex of the anterior face. Metatarsal comb is very narrow and consists of two bristles and is a little longer than the segment is wide, dense hair yellow and the shorter yellow hair extends along the complete posterior edge of the segment, while the denser long hair extends only over the basal half.

*Wings*: long, over 2.5 times as wide. Costal index 2.7. Veins pale brown. Spines at second break only thirty degrees apart. Costa with a ventral row of hairs less than twice the width of the costa. Hind cross-vein concave. Halteres pale on club, darker orange-yellow on stalk.

*Abdomen*: first segment light grey. Lateral areas of second segment also light grey. Rest of abdomen with fasciated pattern, very indistinct and grey areas with a distinct olive green sheen.

♀. Spines on fore femora vary in number and size but not in form. Olivaceous dusting more noticeable on some. Hind cross vein almost straight, only just concave.

Face more silvery but still with a distinct yellow tinge. One specimen, probably of this species has the grey markings almost obscured although the outlines are visible. The face is more greyish.

Holotype ♂. ABYSSINIA: Wouramboulchi, Serpent Lake, *c.* 9,000 ft., 5.x.1926 (J. M. Omer-Cooper) to B.M.(N.H.).

Paratypes. 1 ♂, 7 ♀, all same data as type, to B.M.(N.H.). CONGO: Ruanda,

Gite de Nkuli, 6 ♂, 9 ♀, 17.iii.36 (*L. Lippens*); Kivu, Saka, 1 ♂, 14.iii.36 (*L. Lippens*).  
All to M.R.A.C.

Not paratype. Ruanda, Gite de Nkuli, 1 ♂, 17.iii.36 (*L. Lippens*).

***Notiphila (Notiphila) pseudodimidiaticornis* Soika**

(Text-figs. 8, 27)

*Notiphila pseudodimidiaticornis* Soika, 1956b : 125.

A member of the broad cheeked group of species easily distinguished from *Notiphila microscopa* by means of the very short series of facial bristles, ventrally inserted, and the larger hind metatarsal basal scopa which is appreciably longer than the segment is wide. In body form and colouring it closely resembles *Notiphila microscopa* sp. n.

The following brief description characterizes the species. Antennal segments I and II black, segment III dark with slight paling of base; eight to nine lateral hairs to arista. Face and buccae grey, facial series of two to three short but strong bristles, set ventrally, extensive lateral series of hairs. Frons uniformly dark brown.

Mesonotum, scutellum, mesopleura and pteropleura dark brown, becoming grey ventrally. All femora grey-brown, mid and hind tibiae and tarsi pale. Fore femur with the posteroventral series of weak bristles, equal in length at longest to width of femur. Fore tibiae and tarsi with dark dusting. Hind metatarsus with a basal scopa of three long black setae with the pale golden yellow brush of hairs extending over half the length of the metatarsus.

*Wings*: veins pale, with a very slight infumation of the membrane.

The abdomen has the greyish green posterior fasciae reduced to lateral 'wedges' while the median vitta is narrow. The fourth segment has three to four pairs of long setae inserted on the posterior edge. Male genitalia with characteristic lateral broadening of the ventral processes (Text-fig. 27) and a strongly spinose aedeagus.

Material studied. CONGO: Ruanda, Gite de Nkuli, 36 ex., 17.iii.36 (*L. Lippens*); Rutshuru, 1 ex., 11.v.36 (*L. Lippens*); Ruanda, Gite de Nkuli, 2 ex., 25.iii.36 (*L. Lippens*); Ruanda, L. Karago, 2 ex., 21.iii.36 (*L. Lippens*); Kivu, Saka, 5 ex., 14.iii.36 (*L. Lippens*); Ruanda, L. Nyakigubu, 1 ex., 25.iii.36 (*L. Lippens*).

***Notiphila (Notiphila) lunicornis* Soika**

(Text-fig. 25)

*Notiphila lunicornis* Soika, 1956b : 124.

A large species, recorded only from the Congo. The colour of the hind metatarsal setation delimits this species from all but *Notiphila ignobilis* Loew, and *Notiphila lyalli* sp. n. Easily distinguished from both by the weaker and more ventral facials, larger size, dark antennae and pale fore tarsi.

Antennae totally dark, some pale dusting on the first and second segments, arista with ten lateral hairs. Face golden, buccae grey. Frons, mesonotum and majority of the abdominal segments dark brown. Two strong curved, short facial bristles. Pleura, and laterally on mesonotum, olive-green to grey, legs yellow with strong grey dusting on femora. Posteroventral bristle series of fore femora, equal in length to the width of the femur, five in number. Hind

metatarsus in lateral view with scopa of three strong black spines, and dark pile along the complete internal edge. Four to five millimetres in length. Male epandrial processes as Text-fig. 25.

Material studied. CONGO: Ruanda, L. Karago, 6 ♂, 8 ♀, 21.iii.36 (*L. Lippens*); Ruanda, Gite de Nkuli, 3 ♀, 17.iii.36 (*L. Lippens*); Kamogobe (Sud Masisi), 1 ♂, 4.iii.36 (*L. Lippens*).

***Notiphila (Notiphila) pseudobscuricornis* Soika**

(Text-fig. 28)

*Notiphila pseudobscuricornis* Soika, 1956b : 124.

Similar in form to *Notiphila omercooperi* and *Notiphila microscopa* but easily distinguished from both by means of frontal pattern (no grey patches), and hind scopa and genitalia (Text-fig. 28). This species possesses a reduced form of the 'fan-like' hypandrial sclerites of the other two.

Antennae black, segment III with pale pubescence, ten hairs to arista. Face golden with four long, curved, very weak facials. Buccal bristle also long and weak.

Bristling on fore femora long but weak, equal in length to the width of the femur. A number of erect short hairlike bristles on fore tibia. Hind metatarsal scopa short, with pale setation over complete internal face. Body colour similar to *Notiphila lunicornis* and 5-6 mm. in length.

I have only seen specimens of this species from the Congo.

CONGO: Ruanda, Gite de Nkuli, 71 ex., 17.iii.36 (*L. Lippens*); Ruanda, L. Karago, 56 ex., 2.iii.36 (*L. Lippens*); Kamogobe (Sud Masisi), 1 ex., 4.iii.36 (*L. Lippens*); Kivu, Sake, 6 ex., 4.iii.36 (*L. Lippens*); Rutshuru, 2 ex., 11.v.36 (*L. Lippens*).

***Notiphila (Notiphila) swarabica* sp. n.**

Related to *Notiphila ignobilis* and of similar size and form but differing most noticeably in possessing weaker facial bristles and yellow hind metatarsal brush.

♂. *Head*: antennal segments I and II dark, segment III pale with dusky tip and dorsal rim. Arista pale with two lateral hairs, arista nearly twice as long as segment III. Face golden yellow, carina strong over the dorsal two thirds of the face. Lateral pads just discernible with numerous weak hairs extending from the lower buccal angle to just short of the antennal foveae. Four weak, but long and curved bristles in the facial series, separated medially by less than half of the length of one bristle. Epistoma grey dusted, palps pale orange-yellow with six small hairs along the ventral edge of the external face. Cheeks narrow. Parafacial region yellow, grading to grey on the cheeks and posterior buccae. Buccal bristle shorter than, but of similar strength to, the lower facial bristles. Posterior buccal bristle of same size and strength as buccal. Postbuccal region, the postocular, darker grey and covered with short decumbent bristles. Frons dark greenish brown, the shade of brown depending on the angle of the light, the anterior region with a few weak hairs. Light brown area around ocellar triangle extending to the anterior frontal suture. Para-orbital plates pale buff when viewed at an angle, with a number of long thin hairs along their length, being most noticeable between the verticals and the fronto-orbital. One small extra proclinate 'fronto-orbital'. Longest of the hairs on the ocellar triangle behind the ocellar bristles less than half the length of the ocellars. Posterior vertical bristles long, almost meeting medially.

*Thorax*: mesonotum pale greyish brown, with numerous decumbent hairs evenly scattered over the mesonotal surface and those between the dorsocentrals not arranged in rows or modified



in any way as acrostichals. Scutellum of a similar colour and with scattered hairs. Two faint darker brown bands along the sides of the mesonotum passing through the intra-alar bristle to the scutellar suture. Pleura almost totally grey, except for a slight pale brown dusting on the dorsal edge of, and a small dark brown patch in the centre of, the mesopleuron. Hairs on the pleura short and weak.

*Legs*: fore legs: coxae grey with very short hairs in irregular rows, and three strong bristles extending from the apex. Femur grey dusted, one member of the posterodorsal series very strong, longer than the width of the femur. Posterior dorsal series well developed, six in number and slightly curved. Tibiae slightly darkened, especially on the apical two thirds. Black hairs on the posterior face slightly elongated, producing a dark comb effect. Tarsi pale, last segment darker and only slightly wider at apex than at base. Middle legs, femur grey dusted and apart from the male combs has two strong bristles inserted on the anterior face, about one third the distance from the apex. Tibiae totally pale, with three erect dorsal spines, two subequal apical spines ventrally, plus a number of small spines around the base. Tarsi pale apart from the last segment. Hind legs, femur grey, no strong bristles. Hind tibiae darkened on the dorsal side, with three short ventral spines. Hind metatarsus with a comb of four long black spines and a pale yellow pile extending thickly over the basal third and then shortening to the apex. Tarsi pale apart from the last segment.

*Wings*: broad, two and a half times as long as broad, veins pale brown, darker on the hind part of the wing and the hind cross vein. Spines at the break at an angle of greater than 45°. Haltere with a pale yellow club and orange-yellow base.

*Abdomen*: median grey vitta broadening posteriorly to include the majority of the last segment. The chocolate-brown fasciae on the anterior half of the segment, except where it delimits the grey median vitta and there, reaches the ventral edge of the segments. The first segment is totally grey. There are long hairs on the last and the penultimate segments.

The male genitalia are similar to *Notiphila ignobilis*, with the aedeagus strongly armed with black spinules, but the ventral projections are attenuated.

Material studied. One male with the same data as holotype, but with more brown on the mesonotum; as part of the face and frons are missing this specimen is not included as a paratype. Three females with the same data as holotype but differing from the type in having slightly darker legs and third antennal segments, fewer small facial bristles and less brown on the abdomen. One specimen has the mesonotum slightly golden.

Holotype ♂. YEMEN: Ghaiman, about nine miles S.E. of Sana, c. 8,700 ft., 18.ii.1938 (*H. Scott and E. B. Britton*). 'Found near irrigation stream'.

Paratypes. 3 ♀, same data as type. All types to B.M.(N.H.).

### *Notiphila (Notiphila) ignobilis* Loew

(Text-fig. 17)

*Notiphila ignobilis* Loew, 1862: 12.

*Notiphila ignobilis*, Loew; Cresson, 1947.

*Notiphila ignobilis* Loew; Wirth, 1956.

*Notiphila ignobilis* Loew; Soika, 1956.

This is the most widespread and common of the Ethiopian species of *Notiphila*, and shows considerable variety of form. The variation in the male genitalic structures, between widely separated areas, is sufficiently distinct to suggest some geographical subspeciation. The three male specimens from which Loew described

this species are all from Southern Africa. I have designated a LECTOTYPE and two paralectotypes, the lectotype specimen is that from Caffraria mentioned by Cresson (1947 : 120).

LECTOTYPE ♂. A pale generally cinereous specimen, with greatly reduced abdominal pattern. *Head*: the arista has ten lateral hairs. Antennal segments I and II pale orange-yellow, antennal segment III with tip dusky, basal half pale reddish orange. Face yellow, pale, with three pairs of large, strong bristles plus three smaller bristles in the ventral extension of the series. Buccae yellow grading to grey on the postbuccae. Porrect buccal bristle long, about three fifths the length of the head. Buccal bristles long and erect, two long equal post-buccal bristles. Frons grey-brown with golden brown dusting. Inner vertical bristles equal to height of the head and outer vertical bristles three quarters the length of the inner.

*Thorax*: mesonotum olive-buff with slightly browner, very indistinct, areas and median vittae. Mesopleuron with a very pale and indistinct brown patch and three very weak bristles between the lower strong bristle and the ventral edge of the mesopleuron.

*Legs*. All legs, apart from the heavily grey dusted femora, pale. Hind metatarsal segment with a black scopa and a black dense brush of setae. Fore femoral minispines very distinct, about two thirds apical anteroventral length, outer series of bristlelike hairs six in number, and at their longest equal to the width of the femur.

*Wings*, with pale orange-yellow veins. Hind cross vein almost straight.

*Abdomen*: abdominal brown markings in a series of four broken bands, the centre pair delimiting the median light brown vitta. Most lateral bristles arising from brown markings. Epandrial processes as Text-fig. 17.

In common with many other species of *Notiphila*, *N. ignobilis* has occasional specimens in any series with variable amounts of dark golden yellow dusting, often completely obscuring the underlying pattern.

Considerable colour variation occurs in other areas, none of them consistent enough, in my opinion to warrant subspecific rank. The face may be strongly dusted with grey, almost masking the yellow in places, frons and mesonotum may be dark brown and the abdomen with strong brown fasciae. These described variations are particularly prevalent in Southern, Eastern and Malagasy regions of Africa. Specimens from Northern, Western and Central Africa often have very pale yellow facial regions, and very few brown markings on the thorax and abdomen.

A very small race of this species is found in some regions of the Congo.

Material studied. SOUTH AFRICA: Natal, Ahrens district, nr. Lilani, 6 ♂, 5 ♀, iv. 1962 (*B. & P. Stuckenberg*); Transvaal, Nelspruit, 1 ♂, xi. 1959; Transvaal, Skukuza, 1 ♀, 23. xi. 1959; Port St. Johns, 1 ♀, 20-25. xi. 1961 (*B. & P. Stuckenberg*); Natal, Pinetown district, Gillitts, 1 ♀, 20. xii. 1961 (*B. & P. Stuckenberg*). Basutoland, Maseru District, Maloti Mountains, Makhaleng Valley, Blue Mountain Pass, 2, 150-2,525 m., 1 ♀, 12-14. i. 1963 (*B. & P. Stuckenberg*). MADAGASCAR: Fenerive, Lagoon shore, 1 ♂, 3 ♀, xii. 1955 (*B. Stuckenberg*); Ranomafana, 3 ♂, 2 ♀, xii. 1955 (*B. Stuckenberg*); Fenerive, 1 ♀, xii. 1955, (*B. Stuckenberg*), on beach; Perinet, 1 ♂, xii. 1955 (*B. Stuckenberg*); Tananarive, Tsimbazaza, 1 ♂, 3 ♀, ii. 49 (*R.P.*) Inst. Scient. Madagascar. 'Sur Riz'; Ranomafana, Ifanadiana, 1 ♀, Inst. Scient. Madagascar; Sandrangato, 1 ♂, 1 ♀, Inst. Scient. Madagascar; Centre, Plateau Soaindrana, 2,060 m., Andringitra-Ambalavao, 5 ♂, 12 ♀, 14-17. i. 58 (*B. Stuckenberg*); Centre, Vakoana, 1,520 m., Andringitra Ambalavao, 1 ♂, 1 ♀, 21-24. i. 58 (*B. Stuckenberg*); Est, Navana-Antongil, 6 m. dct. Maroansetra. 1 ♂, 1 ♀, 20-25. iii. 58 (*B. Stucken-*

berg); Centre, Station Agric. Aloatra, 800 m., dct. Ambatondrazaka, 2 ♀, 24.xii.57 (*B. Stuckenberg*); Est, Ivontaka, 15 m., dct. Mananara. 1 ♂, 1 ♀, 10-14.iii.58 (*B. Stuckenberg*); Centre, Moramanga 1,000 m., 18-24.xii.57 (*B. Stuckenberg*); Sandrangato, 2 ♂, 3 ♀, Institut Scientifique Madagascar; Sandrangato, 2 ♀, Institut Scientifique Madagascar; Ranomafana, Infanadiana, 1 ♂, Institut Scientifique Madagascar; Perinet, 1 ♂, 2 ♀, Institut Scientifique Madagascar; Sakotary, 10 km. Nord de Tananarive. 1 ♀, 8.i.18 (*R.P.*); Andobo, 190 m., Forêt Ansingy, dct. Antsalova, 1 ex., ii.57 Institut Scientifique Madagascar; Tam. Perinet, 1 ♂, 6.x.58 (*F. Keiser*); Tam, Perinet, 1 ♂, 13.iv.58 (*F. Keiser*); Tan. Tananarive, 1 ♂, 22.iv.58 (*F. Keiser*); Tan. Tananarive, 6 ♂, 4 ♀, 14.vii.58 (*F. Keiser*); Tan. Tananarive, 2 ♂, 28.viii.58 (*F. Keiser*); Maj. Ambovovy, 7 ♂, 10 ♀, 30.vi.58 (*F. Keiser*); Fia. Ranomafana, 1 ♂, 2.viii.58 (*F. Keiser*); Fia. Ranomafana, 2 ♂, 1 ♀, 3.viii.58 (*F. Keiser*); Tul. Beraketa, 1 ♂, 5.ii.58 (*F. Keiser*); Tam. Moroantsetra, 1 ♂, 4.v.58 (*F. Keiser*); Tam. Moroantsetra, 1 ♂, 29.iv.58 (*F. Keiser*); Tan. Ampefy, Chute d. I. Lily, 1 ♀, 26.iii.58 (*F. Keiser*); Fia. Mananjary, 1 ♀, 13.viii.58 (*F. Keiser*); Fia. Mananjary, 1 ♂, 2 ♀, 11.viii.58 (*F. Keiser*); Tam. Perinet, 1 ♀, 21.ix.58 (*F. Keiser*); Tam. Perinet, 1 ♀, 2.x.58 (*F. Keiser*); Fia. Ambalamanakana, 1 ♀, 19.i.58 (*F. Keiser*); Fia. Ambalava, 2 ♀, 29.i.58 (*F. Keiser*); Tam. Moramanga, 1 ♀, 20.xii.57 (*F. Keiser*); Tan. Ampefy, Lac Kavitaha, 1 ♂, 2 ♀, 28.iii.58 (*F. Keiser*); Maj. Amboromalandy, 2 ♀, 2.vii.58 (*F. Keiser*); Fia. Ranohira, 1 ♀, 6.iii.58 (*F. Keiser*); Tam. Tamatave, 1 ♀, 1.xi.58 (*F. Keiser*); Tan. Tanarive, 1 ♀, 13.xii.57 (*F. Keiser*); Fia. Mananjary, 1 ♂, 16.viii.58 (*F. Keiser*); Tan. Manjakatempo, 1 ♀, 3.i.58 (*F. Keiser*) Licht-Fang; Tan. Antsirabe, 3 ♀, 15.i.58 (*F. Keiser*), 'Licht-fang'.

NIGERIA: Zaria, Kufena ponds, 2 ♂, 3 ♀, 30.iii.66 (*J. C. Deeming*); Ibadan, 2 ♀, 16-19.i.66 (*J. C. Deeming*); Bida, 1 ♀, 21.xii.65 (*J. Lyall*); Zaria, Samaru, 10 ex., 25.v.1966 (*J. C. Deeming*), Irrigation ditch.

ABYSSINIA: Marsh nr. Lake, Hora Abjata, c. 5,000 ft., 5 ex., 18.xi.26 (*J. Omer-Cooper*); Mount Zuquala, c. 9,000 ft. 4 ex., 22.x.26 (*J. Omer-Cooper*).

UGANDA: Katosi, 3 ex., 20.ix.1933 (*E. G. Gibbins*), on debris at edge of lake.

ANGOLA: Huila district, 1 ex.; Rio Coroca, 8 mls. N. of Porto Alexandre, 23.vi.1954 (*J. Balfour-Browne*), flying round pools.

TANGANYIKA: Ukiriguru, 2 ex., 12.ii.59 (*I. A. D. Robertson*), Light trap.

ZAMBIA: Nr. Lake Bangweulu, N'Salushi Island, 1 ex., 16.xi.46 (*M. Steele*).

UGANDA: Ruwenzori Range, Kilembe, 4,500 ft., 1 ex., xii.1934-i.35 (*F. W. Edwards*).

RHODESIA: Mazoe, 1 ex., 10.vi.28 (*A. Cuthbertson*).

KENYA: Kazinga Ferry, 4 ex., viii.46 (*Van Someren*); Meru, 2 ex., vii.43 (*Van Someren*); L. Nabugabo, 6 ex., viii.46 (*Van Someren*); Nairobi, 1 ex., vii.30 (*Van Someren*); Mivea, 3 ex., 4.xii.56 (*J. F. Graham*), Rice stems.

#### Subgenus *AGROLIMNA* Cresson

Type-species, *N. scalaris* Loew, 1862 : 134 (Orig. design.).

Established by Cresson (1917) for those species with the following combination of characters.

Facial series consisting of weak hairlike bristles, inserted over the complete vertical length of the face. Four erect dorsal spines on the mid tibiae, no male mid femoral comb of setae on ventral face of femur. Basal scopa of bristles on hind metatarsal segment pale yellow to dark brown, never black. Male genitalia with external claspers or surstyli fused to ventral aspect of epandrium (Text-fig. 4).

With the exception of *Notiphila (Agrolimna) bipunctata* Loew, a most homogeneous group of species with rather slight specific differences and requiring confirmation of any determination by genitalic comparisons.

### *Notiphila (Agrolimna) bipunctata* Loew

(Text-figs. 1, 2, 5, 6)

One of the most distinctive of *Notiphila* species, easily distinguished from all others by the two velvety black patches on the vertex. The male genitalia show an intermediate condition between that of the two subgenera (Text-figs. 1, 2, 5, 6), while the external claspers are free of the epandrium, the ventral edge of the epandrium is produced into two rounded protuberances.

♂. *Head*: antenna almost totally pale, slight darkening on dorsal edge of segment III. Thirteen hairs to arista; very strong curved spine on segment II. Face pale golden yellow with central carina brown over ventral half. Facial hairs long but weak. Buccae silver-grey. Two velvet black patches between fronto-orbital and large inner verticals.

*Thorax*: fore legs darkened, fore tarsi paler than the mid or hind tarsi. Femur and last two segments of tarsi darkened on middle leg, femur and apical half of tibia on hind leg. Five broad, brown stripes on mesonotum, grey-green ground colour. One stripe from humeral region to large posterior bristle on mesopleuron, rest grey.

*Abdomen*: brown fasciae delimit central grey vitta which extends on to second segment.

*Wings* with deep cleft at break and veins clouded strongly along their length.

Material studied. Holotype ♂. AFRICA: Svakop, 53 325, (*J. Wahlb.*).

CONGO: Katanga, Tenke, 1 ♂, 30. vii.–9. viii. 31 (*J. Ogilvie*).

S. AFRICA: Transvaal, Kruger National Park, 1 ♂ (*T. D. A. Cockerell*); Umtabi, Tronskri, 1 ♀, 18. ii–18. iii. 23 (*R. E. Turner*); Natal, Weenen, 1 ♀, xi. 1928–iii. 1929 (*H. P. Thomasset*); Natal, Drakensberg, 1 ♂, iii. 1959 (*B. R. & P. J. Stuckenberg*); Cathedral Peak Area, 1 ♂, 1. i. 54 (*B. Stuckenberg*).

RHODESIA: Salisbury, 1 ♂, iv. 1927 (*A. Cuthbertson*); Rhodes, Inyanga Park, 1 ♂, 13. i. 55 (*B. R. Stuckenberg*); Umtali, 1 ♀, i. 1955 (*B. R. Stuckenberg*).

MOZAMBIQUE: Nr. Machipanda, 1 ♀, 19. i. 55 (*B. R. Stuckenberg*).

KENYA: Kiabiti Hill, Embu, 1 ♂, vii. 1948 (*Van Someren*).

### *Notiphila (Agrolimna) obscuricornis* Loew

(Text-fig. 31)

*Notiphila obscuricornis* Loew, 1862 : 12.

*Notiphila venusta obscuricornis* (Loew) Cresson, 1947: 118.

*Notiphila obscuricornis* Loew; Wirth, 1956 : 387.

*Notiphila subcornuta* (Soika) Soika, 1956b : 125.

A relatively large species for this subgenus, from southern and eastern regions of Africa, replaced in the Congo by *Notiphila dimidiaticornis* Soika, and on Mada-

gascar by *Notiphila andrana* sp. n., from both of which it may be distinguished by antenna colour, fore tibial dusting and male genitalia (Text-fig. 31).

Loew's original type series consisted of two female specimens, from which I designate as LECTOTYPE the specimen bearing the following data. 'Svakop. Africae; J. Wahlb, 50,323. (245,66). Rikmuseum, Stockholm'.

The female paralectotype bears the following data. 'Svakop. Africae. J. Wahlb, 53,329. (245, 66) Rikmuseum Stockholm'. Both type specimens are returned to the Stockholm Museum.

Lectotype ♀. The following are emendations and additions to Loew's original description.

*Head*: antennal segments I and II dark, segment III dark dorsally and apically. Thirteen hairs to arista. Facial hairs short, not greater than half the buccal bristle length and less than half as strong. Two slightly subequal posterior buccal bristles. Fore femur with three widely separated rows of closely set hairs on the posteroventral and ventral faces. Fore tibiae pale with dark dusting on the apical two thirds. Fore metatarsus with, slight yellow basal scopa and numerous dark hairs and weak bristles. Tarsi progressively darker towards apex. Mesonotal stripes very obscure, hidden by ground colour, latter extends on to pleura as far as the largest of the posterior mesopleural bristles. One large bristle on anterior face of middle femur. Middle tarsal segment dark. Hind tibiae pale without brown area on apical half. Apical two tarsal segments darkened.

*Wings*: brown veined, slight infumation.

*Abdomen*: brown fasciae strongly delimited on all but the second segment.

SOUTH AFRICA: Natal, Weenen, 1 ♂, 1 ♀, iii-iv.1925 (*H. P. Thomasset*); Pretoria, 1 ♀, v.1948 (*J.C.F.*); Natal, Nr. Thornville, Umlazi River, 1 ♂, 27.iv.55 (*B. Stuckenberg*); Pietermaritzburg, Town Bush, 1 ♂, 6.x.60 (*B. & P. Stuckenberg*); Natal, nr. Richmond, Taberi River, 1 ♀, 27.iv.55 (*B. Stuckenberg*); E. Transvaal, Marleposkop, 1 ♀, x.56 (*B. Stuckenberg*); E. Cape Province, Barkly East District, Lundean's Nek, 1,925-2,100 m., 1 ♂, 18.i.63 (*B. Stuckenberg*); Natal, Ahrens District, Ns. Lilani, 1 ♂, 1 ♀, iv.62 (*B. and P. Stuckenberg*); Pietermaritzburg, Town Bush, 1 ♂, 12.xii.61 (*B. & P. Stuckenberg*); Natal, Drakensberg, Cathedral Peak Area, Alt. 6,400 ft., 1 ♂, 23.iii.55 (*B. Stuckenberg*).

RHODESIA: Nr. Umtali, Vuma Mount, 1 ♀, 18.i.55 (*B.R.S. & P.G.*); Rhodes-Inyanga National Park, 1 ♂, 13.i.55 (*B.R.S. & P.G.*).

### *Notiphila (Agrolimna) kenyaensis* Cresson

(Text-figs. 12, 30)

*Notiphila venusta kenyaensis* Cresson, 1947 : 119.

*Notiphila kenyaensis* (Cresson) Wirth, 1956 : 387.

Cresson, in his description of this species stated, that the face is grey. I believe that he was referring to an uncommon form, of which I have seen only one or two specimens. The usual facial colour of the species I recognize as *Notiphila kenyaensis* is yellow, with grey parafacials. As I have not seen the type, it may be that the species I recognize is in fact a new species. This species appears to be found only in central and north-eastern areas of the Ethiopian region; I have seen specimens from Abyssinia, the Congo, and Kenya.

The grey faced form differs from the more common form in having a greater eye width to buccal width ratio, but the male genitalia are almost identical (Text-fig. 30).

Antennae totally black, some specimens show a slight lightening at the base of segment three. Arista with twelve to fourteen lateral hairs, face yellow with a prominent central carina, facial hairs long, sparse, and weak (Text-fig. 12). Parafacials and bucca yellowish grey to grey. Buccal and subequal posterior buccal bristles short but relatively strong. Frons heavily dusted with dark greenish brown pollen.

*Thorax*: with mesonotal vittae indistinct, often lacking, usually dark brown. Anterior edge of mesonotum, including the humeral callus with grey dusting. Pleura grey with a dark brown diagonal band from the humeral region to the mid pleurite.

*Wings* long and narrow with a slight diffuse infumation.

*Legs*: with all coxae and femora strongly grey dusted, fore tibia and last tarsal segments pale, but with heavy dusting, rest of legs pale. Only very slight darkening on the hind tibia.

*Abdomen*: median vitta not delimited, grey fasciae extending completely across the posterior half of the segments and expanding on the lateral edge.

ABYSSINIA: Woramboulchi, Serpent Lake, c. 9,000 ft., 22 ♂, 20 ♀, 5.x.1926 (*Omer-Cooper*).

KENYA: Aberdare Range, Mt. Kinangop, 9,000 ft., 6 ♂, 8 ♀, 1.x.1934 (*F. W. Edwards*).

CONGO: Ruanda, L. Karago, 284 ex., 21.iii.36 (*L. Lippens*); Ruanda, Gite de Nkuli, 92 ex., 17.iii.36 (*L. Lippens*); Kamogobe, (Sud Masisi) 5 ex., 4.iii.36 (*L. Lippens*); Terr. Rutshuru, 4 ex., 30.vii.37 (*Mission Prophylactique*); Kivu, Sake, 19 ex., 14.iii.36 (*L. Lippens*); Rutshuru, 2 ex., 28.v.36 (*L. Lippens*); Kivu, Kavimvira, 1 ex., xii.54 (*G. Marlier*), à la lumière; Lac Gardo, N. Kivu, 2 ex., xii.1925 (*Dr. H. Schouteden*); Kivo, Butembo, Nr. Ibina, 1 ex., 10.ii.50 (*G. Marlier*).

### *Notiphila (Agrolimna) andrana* sp. n.

(Text-fig. 35)

This species is very closely related to *Notiphila obscuricornis* Loew, but easily distinguished from it by the following: *totally* pale fore tibiae and hind tibiae, relatively strong facial series of weak bristles, pleura with buff region extending on to the sternopleuron. Brown abdominal fasciae not distinct, grading into the buff-grey posterior regions. Male epandrium sharply pointed ventrally (Text-fig. 35). Ventral hairs on fore femur less crowded.

♂. Antennae, segments I and II black, III dark dorsally and at apex. Nine lateral hairs to arista. Hairlike posterior buccal bristles, palpi bicoloured, yellow-white dorsally to orange ventrally. Median grey vitta just delimited by brown fasciae. Posterior buccal bristles weak. Extra small spine on segment II of antenna, larger spine short. Variable darkening of fore tibiae, some specimens showing considerable darkening.

Holotype ♂. MADAGASCAR: Centre, Lac Froid, 1,620 m., dct. Ambatolampy, 15.xii.57 (*B. Stuckenberg*).

Paratypes. 2 ♂, and 5 ♀, same data as type.

Holotype, 1 ♂ and 4 ♀ paratypes to N.M., 1 ♂ and 1 ♀ paratype to B.M.(N.H.).

*Notiphila (Agrolimna) lineata* Soika

(Text-figs. 4, 7, 34)

*Notiphila lineata* Soika, 1956b : 125.

A distinctive species obviously related to the members of the 'obscuricornis' group of species but easily distinguishable by means of the mesonotal pattern. At present known only from the Congo.

*Head*: antennal segments I and II black, segment III dark over apical half, pale basally, arista with thirteen lateral hairs. Face grey, carina darkened with brown over ventral half. Facial hairs numerous but weak, relatively long. Palpi pale yellow with six to eight long, weak hairs on the ventral surface. Buccae grey, buccal bristle weak, two long weak subequal posterior buccal bristles. Frons with grey para-orbital strips, fronto-orbital strips dark, when viewed at an angle to the light. Frons divided by a dark ocellar strip with white median line.

*Thorax*: mesonotum dark brown with two broad grey vittae passing laterally to the line of the dorsocentrals, the grey becomes brownish over the posterior half of the notum. Scutellum dark brown. Pleura totally grey.

Fore leg almost completely dark, only base of the tibia pale. Middle leg with the femur and the last tarsal segment dark, and the remainder pale. Hind leg with the femur, central one third of tibia and the last two tarsal segments dark.

*Wings* long with the membrane hyaline, veins dark brown and the hind cross vein strongly clouded.

*Abdomen*: narrow grey fasciae on segments three and four only, a broad median grey vitta on segments three, four and five, delimited along its length. Male genitalia as Text-figs. 4, 7, 34.

The above description was taken principally from the type, which is in very poor condition, having lost all the head bristles.

I have seen the following specimens:

CONGO: Kamogobe (Sud Masisi), 4 ♂, 10 ♀, 4.iii.36 (*L. Lippens*); N. Kivu, Lac Gardo, 1 ♂, 1 ♀, xii.25 (*H. Schouteden*).

*Notiphila (Agrolimna) montana* sp. n.

(Text-fig. 29)

A small species, in external form very close to *Notiphila abdita* sp. n. but with totally different male epandrium (Text-fig. 29), the latter being distinctly pointed, not truncate with terminal lateral projections. The following description is based on a comparison between this species and *Notiphila abdita* sp. n.

♂. *Head*: antennae totally black, without trace of red at the base of the third segment. Nine lateral hairs to arista. Face grey with distinct golden yellow undertones. Facials set in a long high series, relatively strong and extending right back to the cheeks along the mouth edge. Para-orbital plate iridescent brown to black, no outstanding orbital bristle, and a very narrow golden strip along the frontal edge of the eye. Final bristle of the posterior orbital series long but weak, and directed medially, separated by the length of one bristle at the tip.

*Thorax*: mesonotum greenish brown with a distinct median brown vitta plus two pairs of distinct incomplete bands, on either side. Scutellum concolorous. Pleura grey, apart from dorsal half of the mesopleuron, which is dark brown.

*Wings*: hyaline, with veins brown and slightly infumated, more so on the posterior cross vein.

*Legs*: fore coxae silvered, rest of fore leg dark, apart from the knees and the base of the tibia. Middle femur and the last two tarsal segments dark, the rest pale. Hind femur, middle third of the tibia and the last two tarsal segments dark.

*Abdomen*: broad median vitta extending from the third segment, only just visible on the hind segment. Vitta delimited by the brown fasciae.

Holotype ♂. S. AFRICA: Basutoland, Maseru District, Bushmans Pass, Maloti Mts., 2,125-2,250 m., 8-14.i.1963 (*B. & P. Stuckenberg*).

Paratypes. 3 ♀ and 5 ♂, same data.

Type to the N.M., 1 ♀, 2 ♂ paratypes to the B.M.(N.H.).

### *Notiphila (Agrolimna) dimidiaticornis* Soika

(Text-fig. 37)

*Notiphila dimidiaticornis* Soika, 1956 : 500.

A member of the 'obscuricornis' group of species, originally intended by the author to apply to all specimens of this form with pale third antennal segments. However, as the lectotype of *Notiphila obscuricornis* Loew also has the base of the third segment pale, *N. dimidiaticornis* is now restricted to those specimens possessing predominantly dark fore tibiae, some paleness around the base of the third antennal segment, male genitalia with the apex of the epandrium rounded (Text-fig. 37), and a rounded lateral process on the external claspers. Only recorded from the Congo and Uganda.

♂. Antennal segment I dark, II pale with heavy dark dusting, III predominantly pale but tip and dorsal edge dark. Arista with thirteen lateral hairs. Face silvery grey, slight darkening of the lower carina. Facial series of numerous, short and weak hairs. Palpi orange-yellow with three to four short bristles on ventral edge. Buccae grey, buccal bristle short but relatively strong. Para-orbital strip greyish white. Fronto-orbital strip paler brown than frons.

*Thorax*: ground colour pale greyish brown with a median vitta plus a series of longitudinal vittae passing through the notopleurals, supra-alars and dorsocentrals. The median vitta divides just anterior to the prescutellars and each fork widens on to the scutellum. Pleura grey with a rectangular brown patch on the mesopleuron.

*Legs*: all coxae strongly dusted with grey, trochanters pale and femora dark with grey dusting. Fore tibia pale over the basal half, tarsi dark. Middle tibia darkened slightly on the lower third, tarsi apart from the last two segments, pale. Hind tibia darkened only narrowly over third, last two tarsal segments dark.

*Wings*: with the hind cross vein only slightly darkened. veins brown.

*Abdomen*: median grey vitta delimited, but not constricted on the posterior edge of the fourth segment, narrow grey fasciae on the second to fifth segments. Grey vitta from either second or third segment and broader posteriorly.

Material studied. CONGO: Terr. Rutshuru, 30.vii.1937 (*Mission Prophylactique*); Ruanda, L. Karago, 15 ex., 21.iii.36 (*L. Lippens*); Terr. Rutshuru, 80 ex., 30.vii.37 (*Mission Prophylactique*); Ruanda, Gite de Nkuli, 25 ex., 17.iii.36 (*L. Lippens*); Kamogobe (Sud Masisi), 19 ex., 4.iii.36 (*L. Lippens*); Kivu, Marais Sasa



(Ngweshe), 1,300 m., 5 ex., 6.v.49 (*G. Marlier*); Rutshuru, Fuku, 24 ex., 15.v.36 (*L. Lippens*); Kasongo, 4 ex., viii.59 (*P. L. G. Benoit*); Urundi, Kitega, 16-1700 m., 2 ex., 3-4.iii.53 (*P. Basilewsky*); Uele, Gangala na Bodio, 14 ex., 14.v.36 (*L. Lippens*); Katanga, Elizabethville, 1 ex., 20.x.29 (*M. Bequart*); Rutshuru, 2 ex., ix-x.1936 (*Delville*); Kibati-Ituri, Kilomines, 1 ex., 24.iv.56 (*R. P. C. Smoor*); Elizabethville, 1 ex., 31.vii.32 (*De Loose*); Nyangwe, 1 ex., 25.iv.18 (*R. Mayne*); Urundi, Bururi, 1 ex., x.48 (*F. François*); Kivu, Butembo, riv. Kalengero, 1 ex., 8.ii.50 (*G. Marlier*).

Apart from the Congolese material I have seen the following: UGANDA: Katosi, 1 ♂, 1 ♀, 20.ix.1936 (*E. G. Gibbins*), 'On debris at edge of lake'; Ruwenzori Range, Kilembe, 4,500 ft., 3 ♂, (*F. W. Edwards*), B.M. E. Afr. Exp. xii.1934-i.1935.

The Uganda specimens are appreciably darker brown on the pleura, mesonotum and hind tibia.

### *Notiphila (Agrolimna) kufena* sp. n.

(Text-fig. 33)

In external appearance very like *Notiphila abdita* sp. n. but differing from it by the darkened facial carina, more obvious thoracic pattern and the male epandrium (Text-fig. 33). I believe this species to be much more closely related to *Notiphila lineata* Soika, from which it may be easily distinguished on mesonotal pattern alone.

♂. Antennae dark, with a pale area at the base of segment III. Twelve lateral hairs to arista, porrect spine on segment II short. Face grey to silvery, at an angle to the light, central carina lightly marked ventrally with brown. Facial hairs short and weak, parafacials shining silvery white. Buccae silver-grey, buccal bristle short and weak. Frons iridescent blackish brown. Para-orbital strip white, fronto-orbital strip appears darker than frons; no outstanding orbital bristle. Black velvet triangular area anterior to ocellar triangle, very elongate, extending to within half its length of frontal edge. Posterior orbital series of bristles very weak and short, the most dorsal member not elongate and inclinate.

*Thorax*: ground colour grey-green with a median brown vitta and a pair of brown vittae along the line of the dorsocentrals, the median line dividing just posterior of the second dorso-central and coalescing with the lines through the dorsocentrals. A pair of lateral broader bands starting posterior to the grey humeral callosity and extending through the intra-alar bristles to the edge of the scutellum. Scutellum with two bands on the disc and darkened laterally with brown.

*Wings* hyaline but all veins infumated to some degree, the posterior cross vein most strongly.

*Legs*: fore coxae silver-grey with a few strong hairs, the rest of the fore leg dark, apart from the base of the tibia, which is testaceous yellow. Mid coxae pale, femur grey dusted, tibia and tarsi, apart from apical two segments, pale. Hind coxae pale, femur grey dusted, tibia with apical half, apart from extreme apex and last two tarsal segments, dark.

*Abdomen*: first and second visible segments almost totally dark brown, lateral edges of second segment grey. Median grey vitta narrow and delimited by brown fasciae, only just extending on to the third segment, constricted on posterior edge of the fourth, and appreciably wider on the fifth.

♀ with appreciably darker facial carina, the colouring often extending laterally to darken the complete lower face.

Holotype ♂. NIGERIA: Zaria, 10.iii.66 (*Lyll & Deeming*).

Paratypes. NIGERIA: Zaria, Kufena, reedy stream, 2 ♂, 2 ♀, 14.ii.66 (*Lyall*); Zaria, Kufena ponds, 1 ♀, 12.iii.66 (*J. C. Deeming*); Zaria, Samaru, 1 ♀, 25.v.66 (*J. C. Deeming*), Irrigation ditch.

Type, and 2 ♂, 2 ♀ paratypes to B.M.(N.H.).

***Notiphila (Agrolimna) bivittata sp. n.***

(Text-fig. 14)

Very distinctive species which is easily distinguished from all others by means of the two broad, lateral, velvety black frontal bands, with a narrow blue-grey frontal region between, black antennae and golden yellow face.

♀. Antennae black, arista with ten lateral hairs, face strongly carinate, golden yellow; parafacialia and buccae grey. Facial series of five to six short weak hairs. Buccal bristle weak and sparsely scattered very short bristles on buccae. Eyes very large, cheeks narrow (Text-fig. 14). Lateral regions of frons and vertex velvety black, median third of frons bluish grey, yellowish anteriorly. Head bristles of normal complement and strength. Postocular bristle weak.

*Mesonotum* brown with a pair of extreme lateral grey vittae and a median pair of less distinct grey vittae. Posterior to the suture are an indistinct pair of grey-brown bifurcated vittae. Very sparse mesonotal setulae. Pleura, excepting brown dorsal half of mesopleuron, grey.

*Legs*: Femora grey dusted, tibiae dark, paler basally, especially on middle tibiae. Tarsi pale, fore tarsi with some dark dusting.

*Wings* with membrane hyaline, veins brown, halteres pale yellow.

*Abdomen*: brown fasciae on all segments, median grey vitta on segments three to five only, broadening posteriorly and strongly constricted on last three segments.

♂ unknown, but as sexual dimorphism is slight in this genus, should be determinable with key provided.

Holotype ♀. CONGO: Ruanda, Lac Mohasi, iv. 1952 (*G. Marlier*), to I.R.S.N.

***Notiphila (Agrolimna) abdita sp. n.***

(Text-fig. 32)

Small species, may be distinguished from the other members of the *obscuricornis* group by the following combination of characters. Antennae with the third segment pale at base, abdomen with a constricted narrow median vitta, face grey, indistinct, but visible thoracic vittae. Hind tibia very strongly darkened. Fore legs dark apart from tibial base. A little dark dusting on middle of mid tibia.

♂ and ♀. *Head*: antennal segments I and II dark, base of segment III pale orange-red, correct spine short. Arista with ten lateral hairs. Face dull to silver-grey, carina strong. Facials short and weak, buccae grey, with buccal bristle about three times the length, and twice as strong, as the facials. Frons iridescent brown, para-orbital edge light brown-white, fronto-orbital plates lighter than frons. Last member of postorbital series short and inclinate but separated by more than the length of one bristle. Orbital bristles numerous, one stronger than the rest and proclinate.

*Thorax*: ground colour buff-brown with indistinct dark brown vittae, latter consisting of a median broader band and two pairs of lateral vittae, one along the line of the dorsocentrals

and the other, interrupted, along the line of the intra-alars. Scutellum with a pair of indistinct vittae. Pleura buff-brown dorsally, grading to grey ventrally, brown mesopleural marking diffuse.

*Wings* hyaline, with slight infumation on the hind cross vein.

*Legs*: fore legs dark, apart from grey coxa and base of tibia, which is yellow. Femoral hairs long, equal to, or longer than, width of femur. Middle leg with femur grey dusted and last tarsal segments dark, remainder of leg pale. Hind leg, femur and all but base and apex of tibia, and last tarsal segments dark.

*Abdomen*: abdominal segment one brown, with lateral grey fasciae. Second segment grey on posterior edge and laterally. Grey vittae on segments three and four, very narrow and totally delimited. The grey fasciae surrounded by brown both anteriorly and posteriorly. Last segment brown medianly, and only grey laterally.

*Genitalia* ♂ distinctive, with two lateral terminal projections on the truncate tip of the epanandrium (Text-fig. 32).

Holotype ♂. S. AFRICA: Natal, Ahrens District, Nr. Lilani, iv.1962 (B. & P. Stuckenberg).

Paratypes. RHODESIA: Zimbabwe, 1 ♂, 28.i.1955 (B.R.S. & P.G.); Umtali, Vumba, 3 ♂, 1 ♀, v.1932 (L. Ogilvie); Umtali, 2 ♀, ix.1927 (A. Cuthbertson). S. AFRICA: Port St. Johns, 1 ♀, 20-25.xi.1961 (B. & P. Stuckenberg); Griqualand East, Ayliff District, Insiswa Mt., 1 ♂, 1 ♀, xi.1961 (B. & P. Stuckenberg); Natal, Pinetown District, Gillits, 1 ex., 1.x.61 (B. & P. Stuckenberg); Natal, Drakensberg, Cathedral Peak Forestry Reserve, Little Berg Summits, Thereda Grasslands, 5,500-6,000 ft., 2 ♂, 3 ♀ (B. & P. Stuckenberg).

Holotype ♂ and ten paratypes to N.M., six paratypes to B.M.(N.H.).

I have also seen four further specimens from Cape Province which may belong to this species, differing in antennal colour, and reduced terminal projections on male epanandrium.

### *Notiphila (Agrolimna) ambata* sp. n.

(Text-fig. 36)

A very small species, easily confused with *Notiphila abdita* sp. n., but distinguished from it by means of the less dark antennae, segment III basal half pale, and the wide, continuous abdominal vitta, not usually constricted by the brown fasciae into segments, plus the shiny silver-white face, almost totally unmarked.

♂ and ♀. A small species, 1.5-2.5 mm., appreciably smaller than the related mainland species *Notiphila abdita*.

*Head*: antennae with segments I and II dark, segment III dark at tip and on dorsal edge, dark reddish orange at base. Arista with eight lateral hairs. Face silver-grey to shining white to golden, central carina distinct and ventrally broad, facial series of hairs weak and short. Buccae grey, buccal bristle about twice as strong, and one and a half times as long, as the facial hairs. Frons iridescent green-brown with ocellar triangle and two fronto-orbital strips iridescent copper to black-brown, only the very slightest white line around dorsal aspect of eye. One small orbital bristle set close to the fronto-orbital. Palpi orange-yellow, with a number of hairs set into the ventral edge of external face.

*Thorax*: dark brown mesonotum with only slight suggestion of vittae, setulae scattered. When held at an angle to light, thorax appears distinctly greenish and brown vittae become

apparent. Scutellum as mesonotum. Pleura dark brown, becoming buff-brown ventrally, metapleuron greyish brown.

*Legs*: fore legs almost totally dark, slight lightening around base of tibiae. Mid femur dark, tibia strongly dusted and tarsi paler, excepting last segment. Hind femur dark, tibia dark over apical half to two thirds, tarsi, apart from last segment, pale.

*Wings*: hyaline, veins dark, no strong bristles along the first costal section, only at the costal break.

*Abdomen*: from third segment brown fasciae delimit, but do not constrict, the median grey-green iridescent vitta.

*Genitalia* ♂. The tip of the epandrium is narrowly truncate with slight protruberances (Text-fig. 36).

Holotype ♂. MADAGASCAR: Tan., Tanarive, 1.ix.58 (*F. Keiser*). To N.M.B.

Paratypes. MADAGASCAR: Fia., Ambalamanakana, 5 ♀, 13.i.58 (*F. Keiser*); Centre, Lac Froid, 1,620 m., dct. Ambatolampy, 3 ♂, 2 ♀, 11-15.xii.57 (*B. Stuckenberg*); Centre, Moramanga, 1,000 m., 1 ♀, 18-24.xii.57 (*B. Stuckenberg*). N.M., N.M.B.

### PARALIMNA Loew

*Paralimna* Loew, 1862a : 138.

*Paralimna* Loew; Loew, 1862b : 13.

*Paralimna* Loew; Cresson, 1916 : 102.

*Paralimna* Loew; Cresson, 1947 : 108.

Type-species, *P. appendiculata* Loew (mon.) = *punctipennis* Wiedemann.

The largest genus, in number of species, of the Ethiopian Ephydriidae, comprising three distinct subgenera and thirty-seven species in seven species groups.

The genus may be distinguished by the following characters: Costal vein extending to the fourth longitudinal vein, two notopleural bristles, four pairs of dorsocentral bristles and numerous scattered setulae on the mesonotum. One sternopleural bristle present, and three erect strong dorsal bristles on the mid tibia. Frontal, fronto-orbital ocellar and vertical bristles usually well developed.

Far less homogeneous as a genus than *Notiphila* and consequently the species are more easily determined on such characters as facial shape, bristle number and arrangement, and male fore femoral armature. The two new subgenera differ considerably in form from the characteristic subgenus *Paralimna* but possess all the diagnostic characters of the genus, and I have preferred to retain them here.

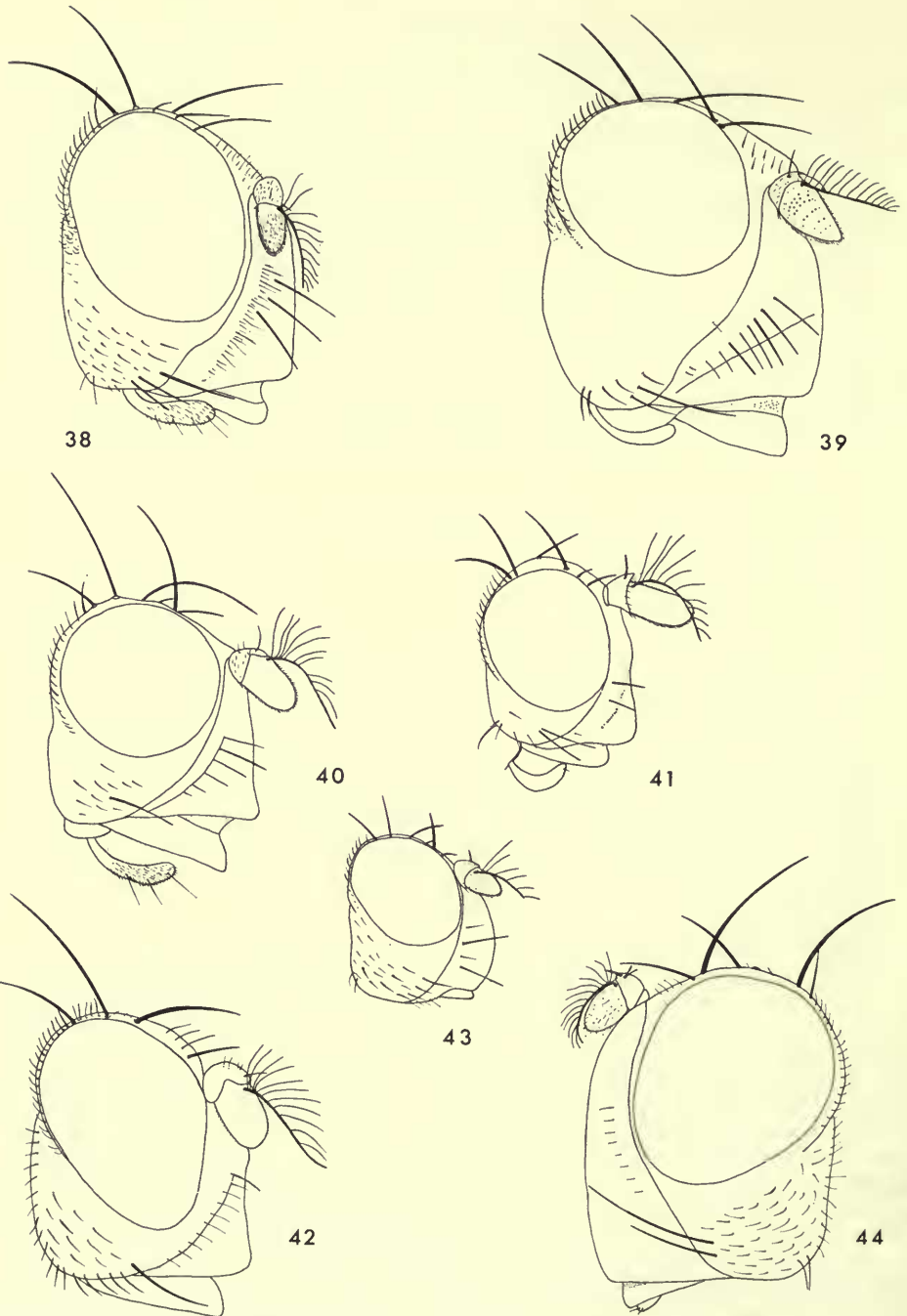
The male genitalia may be used as diagnostic characters in grouping the species into subgenera and into the seven species groups. Considerable differences are noted between species groups, many of which I suspect are of a mechanical nature, rather than of phylogenetic significance, and related primarily to the size of the copulants. Male genitalia do not exhibit such obvious differences between closely related species as those of *Notiphila*.

The complete male genitalia are shown in Text-fig. 9, so that the position of the component sclerites may be noted, as hereafter only individual parts are figured.

A key to the species and subgenera is provided and it should be noted that *Paralimna nidor* Cresson, is keyed twice in separate sections of the key, due to the two distinct facial colour forms found in this species.

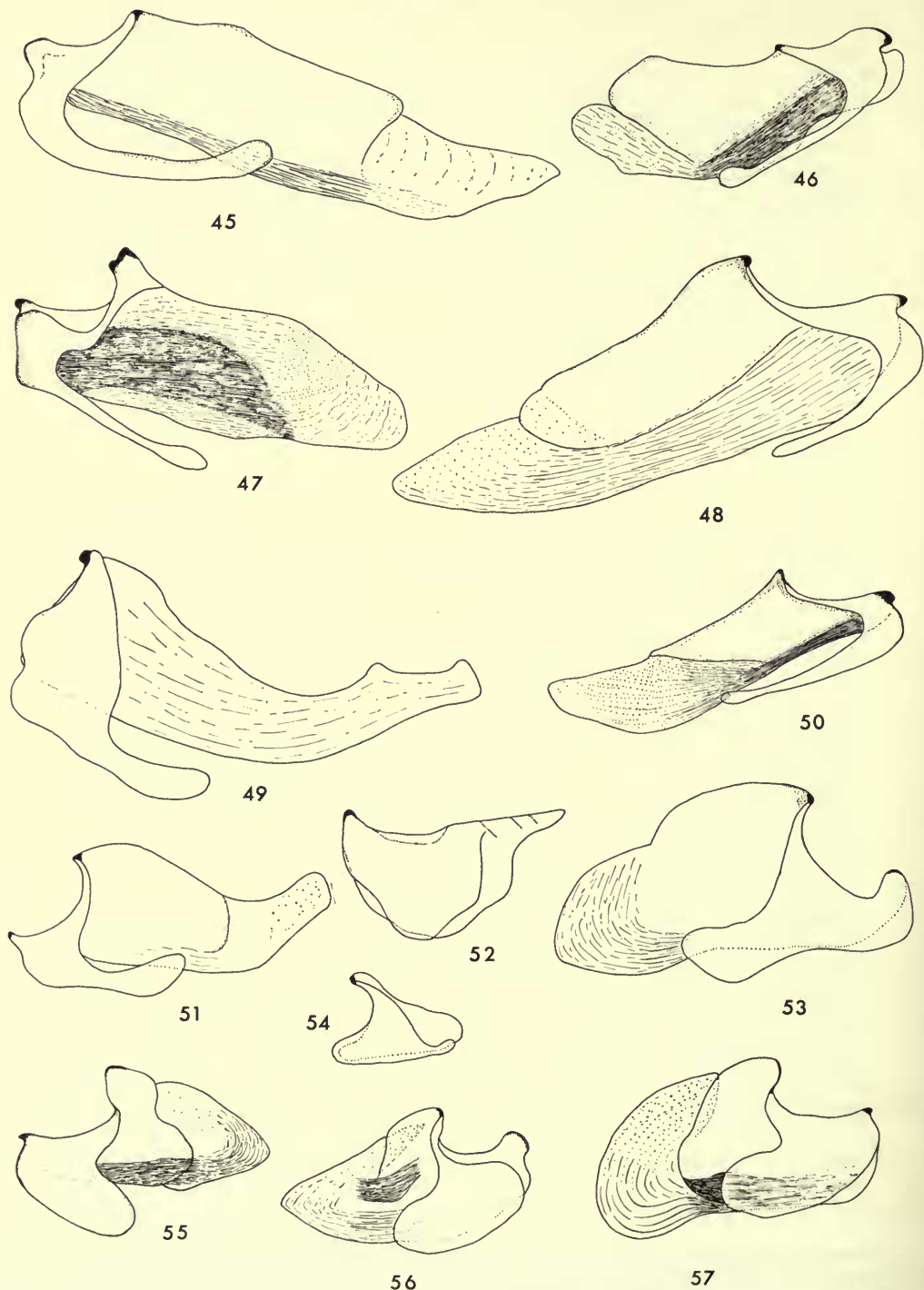
KEY TO THE ETHIOPIAN SUBGENERA AND SPECIES OF *PARALIMNA*

- 1 Buccae and mesopleura totally silver dusted or abdomen grey and without fasciated pattern . . . . . 2
- Buccae and mesopleura, at most, grey dusted, abdomen with a bicoloured fasciated pattern . . . . . (Subgenus *PARALIMNA* Loew) (p. 324) 5
- 2 Two strong, subequal, posterior mesopleural bristles, eyes and buccae bulbous (Text-fig. 42), males may have a dark area in marginal cell of wing, abdomen not totally grey . . . . . (Subgenus *AFROLIMNA* sgen. n.) (p.322) 3
- Only one strong mesopleural bristle, the dorsal bristle reduced, male may have dark facial dusting . . . . . (Subgenus *OEDENOPIFORMA* sgen. n.) (p. 319) 4
- 3 Notopleuron silver dusted, abdomen without lateral silver stripes on segment II, wing of male immaculate . . . . . *carolinika* sp. n. (p. 322)
- Notopleuron brown, abdomen with lateral silver stripe on segment II, wing of male with a dark patch in marginal and submarginal cells . . . . . *keiseri* sp. n. (p. 323)
- 4 Face of female yellow, antennae greyish dusted, male unknown *argentea* sp. n. (p. 322)
- Face of female silver-grey, antennae dark brown, face and buccae of male dark velvety brown . . . . . *madecassa* Soika (p. 321)
- 5 Pleura with horizontal brown vittae, third antennal segment more than twice as long as broad (Text-fig. 41) . . . . . (*limbata*-species grp.) 6
- Pleura without horizontal brown vittae, third antennal segment invariably one and a half times as long as broad . . . . . 7
- 6 Wings with hind cross-vein darkened (Pl. 1) . . . . . *limbata* Loew (p. 326)
- Wings with brown reticulate pattern (Pl. 1) . . . . . *reticulata* sp. n. (p. 327)
- 7 Facial profile consists of a vertical face, without a distinct carina but often with a protruding interfoveal region; frons and vertex horizontal, antennae inserted in line with the most dorsal region of eye (Text-fig. 44), usually large species  
(*arabica*-species grp.) 16
- Facial profile consists of a convex face, usually with a distinct carina; frons and vertex convex, antennae inserted in line with the middle region of eye (Text-fig. 40) 8
- 8 Anterior fronto-orbital angles velvety black, median section of anterior frons slightly raised. Posterior fronto-orbital bristle usually less well developed than anterior bristle, or even absent . . . . . 9
- Not as above . . . . . 23
- 9 Wings immaculate . . . . . 10
- Wings maculated . . . . . 12
- 10 Second antennal segment with a round, flattened white area on the dorsal surface, velvet-black frontal region bounded by a yellow mark but without a niveous pupil  
*albonotata* Loew (p. 351)
- Second antennal segment without such a round white area, velvety black area with a niveous pupil . . . . . 11
- 11 Median, raised, anterior region of frons crenulate, small species *basilewskyi* Soika (p. 351)
- Median region not crenulate, larger species . . . . . *pupulata* Cresson (p. 349)
- 12 Anterior fronto-orbital bristle weak, only a little stronger than posterior fronto-orbital bristle . . . . . *approximata* Cresson (p. 349)
- Anterior fronto-orbital strong, and usually at least twice the length of the posterior 13
- 13 Marginal cell without any white areas of pattern, although second longitudinal vein may bear numerous infumated adventitious branches . . . . . 15
- Marginal cell with patterning (Pl. 1, fig. 6) . . . . . 14
- 14 Only cross-veins, including partial or complete adventitious cross-vein darkened (Plate 1, fig. 6) . . . . . *vansomereni* Cresson (p. 347)
- Two cross-veins and numerous round patches in submarginal cell darkened (Pl. 1, fig. 5) . . . . . *cressoni* sp. n. (p. 348)



FIGS. 38-44. Heads of *Paralimna* spp.: 38, *Paralimna nigripes* Adams; 39, *P. albonotata* Loew; 40, *P. cressoni* sp. n.; 41, *P. reticulata* sp. n.; 42, *P. carolinika* sp. n.; 43, *P. madecassa* Soika; 44, *P. monstruosa* Soika.

- 15 Numerous adventitious veins present, either branches or complete cross-veins (Pl. I, fig. 8) . . . . . *mackieae* Cresson (p. 346)
- No adventitious veins, branches nor cross-veins . . . . . *confluens* Loew (p. 345)
- 16 Facial bristles hairlike and porrect, face without a strong protuberance . . . . . 17
- Facial bristles with at least one strong member, usually partially reclinate, may possess a strong facial protuberance . . . . . 18
- 17 Facials long, extending beyond the facial edge when viewed laterally, buccal bristle very long and slender, palpi and fore tibiae dark . . . . . *lynx* Cresson (p. 343)
- Facials short and very weak, not extending beyond facial edge when viewed laterally, buccal bristles strong, tips of palpi and fore tibiae pale . . . . . *monstruosa* Soika (p. 342)
- 18 Buccae and sternopleura predominantly dark brown, females may have only the anterior edge of buccae brown . . . . . 19
- Buccae and sternopleura predominantly grey . . . . . 21
- 19 Face mainly grey, brown of buccae extending onto sides of ventral facial region, fore tibia paler than femur. Broad grey lateral vitta of mesonotum joining grey lateral areas of abdomen to produce a continuous lateral band, female only . . . . . *lamborni* Cresson (p. 345)
- Face predominantly pale brown and without a grey lateral band on thorax and abdomen . . . . . 20
- 20 Wings only infumated along edges of veins, at least lower half of face grey . . . . . *nebulosa* Wirth (p. 343)
- Wings totally infumated, face and majority of pleura brown . . . . . *pokuma* Cresson (p. 344)
- 21 Face pale brown, wings with darkening on apices of veins and hind cross-veins, darkened areas in apical third of costal and marginal cells, and below point of fusion of first long vein and costa . . . . . *arabica ugandensis* ssp. n. (p. 341)
- Face pale grey, wings may be infumated along veins . . . . . 22
- 22 Cinereous species, vittation of mesonotum indistinct or absent, mesopleuron almost unmarked, abdominal pattern with brown fasciae reduced and margins between fasciae indistinct . . . . . *arabica arabica* Becker (p. 340)
- Vittations of mesonotum more pronounced, median vittae well marked, mesopleuron with a central angular brown mark of varying size, abdomen with fasciated pattern well defined . . . . . *arabica nubifer* Cresson (p. 341)
- 23 Buccae and pleura dark brown, fore femoral armature of male, if present, consisting of curved flat bristles . . . . . 24
- Buccae and pleura predominantly grey, fore femora of male with numerous rows of closely set spinose setae or curved flat bristles . . . . . 38
- 24 Ventral region of face grey, whitish grey or yellow . . . . . 25
- Ventral region of face brown, or yellowish brown . . . . . 33
- 25 Frontal bristle inserted lateral to, or anterior to, the anterior fronto-orbital bristle . . . . . 28
- Base of frontal bristle posterior to that of anterior fronto-orbital bristle . . . . . 26
- 26 Frontal bristle situated well posterior of anterior fronto-orbital, very much nearer the posterior fronto-orbital . . . . . 27
- Frontal bristle situated only just posterior to anterior fronto-orbital, face strongly convex and epistoma receding. Only eight flattened setae on male fore femora, all inserted over the apical quarter . . . . . *sponsa* Soika (p. 338)
- 27 Ocellar bristles of male cruciate, large species with buccae and lateral regions of face dark brown . . . . . *cruciata* sp. n. (p. 333)
- Ocellar bristles of male proclinate; small species with buccae and lateral facial regions not totally brown . . . . . *adversa* Cresson (p. 336)
- 28 Small species, less than 3 mm. in length; face very lightly dusted with grey . . . . . *insolida* sp. n. (p. 335)
- Larger species, greater than 3 mm., face not lightly dusted with grey . . . . . 29
- 29 Brown of buccae extending on to lateral facial region . . . . . 30
- Brown of buccae not extending on to lateral facial region . . . . . 31



FIGS. 45-57. Aedeagus and parameres of *Paralinna* spp.: 45, *P. setifemur* Cresson; 46, *P. puncticollis* Becker; 47, *P. pokuma* Cresson; 48, *P. nebulosa* Wirth; 49, *P. albonotata* Loew; 50, *P. cruciata* sp. n.; 51, *P. pupulata* Cresson; 52, *P. reticulata* sp. n.; 53, *P. approximata* Cresson; 54, *P. aequalis* Cresson; 55, *P. vansomereni* Cresson; 56, *P. mackieae* Cresson; 57, *P. confluens* Loew.



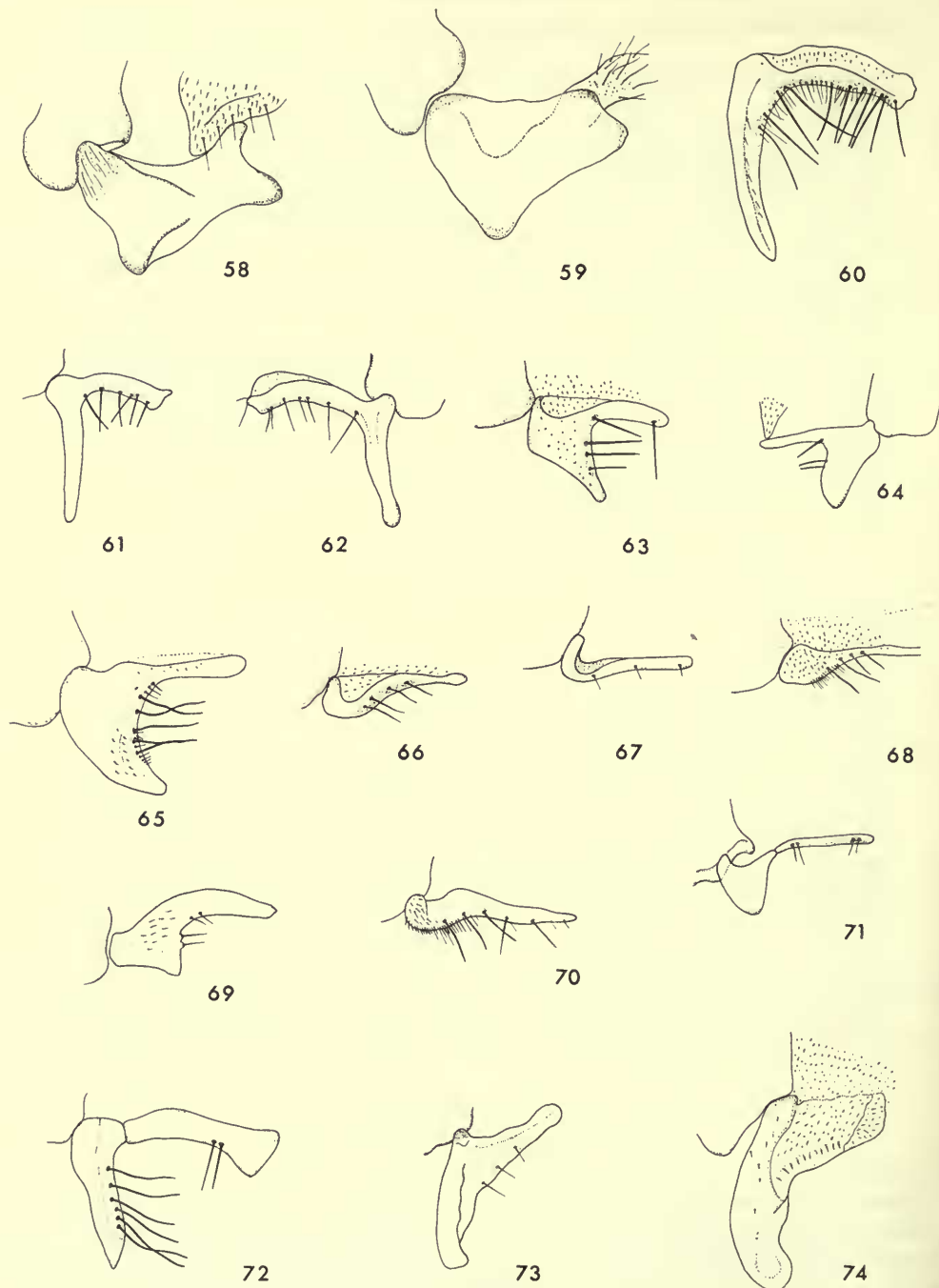
- 30 Posterior fronto-orbital short, less than half length of anterior bristle (Text-fig.38)  
*nigripes* Adams (p. 329)  
 — Posterior fronto-orbital long, almost as long as anterior fronto-orbital bristle  
*mariae* sp. n. (p. 333)
- 31 Facial series of two weak bristles, and three to four short hairs. Male fore femoral comb very reduced or absent . . . . . 32  
 — Facial series of three to four usually strong bristles and four to five short hairs. Male fore femoral comb of ten to twelve short, curved, but not strongly flattened setae . . . . . *puncticollis* Becker (p. 331)
- 32 Face yellowish grey, lateral mesonotal regions grey . . . . . *poecila* Wirth (p. 332)  
 — Face only grey ventrally, mesonotum brown laterally . . . . . *nidor* Cresson (p. 337)
- 33 Reclinate frontal bristle posterior to anterior fronto-orbital; head and thorax may be unicolourous . . . . . 34  
 — Reclinate frontal bristle lateral or anterior to the anterior fronto-orbital . . . . . 36
- 34 Head and thorax generally unicolorous, often with dense golden brown dusting, abdomen with an indistinct fasciated pattern. Antennal segment III twice as long as broad . . . . . *aequalis* Cresson (p. 325)  
 — Head and thorax with typical patterning, vittae and irrorations . . . . . 35
- 35 Wings only very slightly infumated, lateral area of mesonotum grey *invisa* Soika (p. 337)  
 — Wings heavily infumated along the veins, whole insect very dark brown  
*ustulata* Wirth (p. 339)
- 36 Wings uniformly infumated, male fore femora unarmed . . . . . *nidor* Cresson (p. 337)  
 — Wings, if infumated, darker along the veins, male fore femora armed . . . . . 37
- 37 Face totally dark brown . . . . . *dorina* sp. n. (p. 334)  
 — Face yellowish brown, median dark vertical vitta on face, wings not infumated  
*dorina rhodesiensis* ssp. n. (p. 335)
- 38 Male with spinose setae on ventral surface of fore femora, female with spines or long hairs . . . . . 39  
 — Male with a series of flattened setae on fore femora, female with short fine hairs . . . . . 40
- 39 Large, 4-6 mm. in length; facial carina and vertical median vitta reddish brown, two to three strong curved facial bristles. Male fore femora and tibiae spinose, posterior buccal region setulose. Female with sparse rows of short spinose bristles on fore femora . . . . . *setifemur* Cresson (p. 330)  
 — Small species, 2-3 mm. in length, facial series of two to three short bristles face and buccae blue-grey. Male fore femora with numerous, less spinose more hairlike bristles on femur only. Posterior buccal region only setulose ventrally. Female with long ventral hairs on fore femora greater in length than width of femur  
*wirthi* sp. n. (p. 353)
- 40 Facial series with at least two strong bristles, anterior fronto-orbital lateral to frontal bristle, tarsi dark . . . . . *nigripes bona* Cresson (p. 330)  
 — Facial series of only one strong bristle, anterior fronto-orbital well in advance of the frontal bristle, tarsi pale . . . . . *uelensis* sp. n. (p. 336)

Subgenus *OEDENOPIFORMA* sgen. n.

Type-species, *Paralimna madecassa* Soika, 1956.

Members of this subgenus are very similar in form to species of the genus *Oedenops* Becker, but are easily distinguished from them by the presence of sternopleural and presutural bristles and short but numerous mesonotal setulae.

The subgenus is characterized as follows: widely separated bristles of facial series, very pronounced sub-antennal area and extreme sexual dimorphism in facial colour. Fore



FIGS. 58-74. Single ♂ external claspers of *Paralimna* spp.: 58, *P. keiseri* sp. n.; 59, *P. carolinika* sp. n.; 60, *P. ustulata* Wirth; 61, *P. sponsa* Soika; 62, *P. nidor* Cresson; 63, *P. pupulata* Cresson; 64, *P. basilewskyi* Soika; 65, *P. approximata* Cresson; 66, *P. vansomereni* Cresson; 67, *P. confluens* Loew; 68, *P. mackieae* Cresson; 69, *P. wirthi* sp. n.; 70, *P. cressoni* sp. n.; 71, *P. aequalis* Cresson; 72, *P. albonotata* Loew; 73, *P. limbata* Loew; 74, *P. reticulata* sp. n.

femora with a row of short blunt spines on the anteroventral surface and the dorsal bristle of the posterior mesopleural pair greatly reduced. There is no fasciated abdominal pattern. The male genitalia are very reduced but the reduction is probably consistent with the small size of the copulants.

Only two species are so far recorded, one from Madagascar and the other from Northern Nigeria, the latter known only from the female. This subgenus may have arisen from a *Paralimna aequalis* Cresson type of ancestor and may eventually have given rise to the genus *Oedenops* Becker, in which the reduction of mesonotal setulae, mesopleural bristles and male genitalia is taken to conclusion.

***Paralimna (Oedenopiforma) madecassa* Soika**

(Text-fig. 43)

*Paralimna madecassa* Soika, 1956b : 123 ♀.

*Paralimna brunneifacies* Soika, 1956b : 123 ♂.

The above synonymy is based only on the author's description as the types *Paralimna madecassa* and *Paralimna brunneifacies* Soika, have never been returned to Tervuren. Study of a series of this species collected by B. R. Stuckenberg in Madagascar convinces me that Soika wrongly sexed the brown faced males of *Paralimna madecassa* and consequently described them as a separate species. Male specimens are difficult to distinguish by an external study of the abdomen and require dissection for confirmation.

This species may be distinguished from *Paralimna argentea* sp. n. by means of facial colour, yellowish grey in the latter species, and the paler antennal colouring.

♀. *Head*: antennae black. Arista with seven to eight lateral hairs. Face grey, very pronounced. Facial series of two widely separated strong bristles (Text-fig. 43) and three to four short bristles on the ventral extension of the series. Buccae grey, darker posteriorly. Palpi black. Frons grey-brown dusted around ocellar region. Fronto-orbital bristles very small.

*Thorax*: silver-grey dusted, overlaid on mesonotum with pale brown and green. Grey laterally on mesonotum. Numerous short mesonotal setulae present. Scutellar colour as for mesonotum.

*Legs* predominantly grey dusted, tarsi pale. Fore femora with nine to ten short blunt spines on the antero-ventral surface.

*Wings*, hyaline membrane with pale brown veins. Halteres pale yellow on stem, head white.

*Abdomen*: silver-grey with light brown and green dusting over majority. Uniformly setulose.

♂. *Face*, buccae and lower frons a velvety blackish brown, differing only slightly from female in other respects. Fore femora with a series of long fine bristles on the postero-ventral surface.

Material studied. MADAGASCAR: Sud, Ampanihy, 250 m., 2 ♂, 7 ♀, 16-18.ii.58 (*B. Stuckenberg*); Sud, Fenerive, Lagoon Shore, 3 ♂, 2 ♀, xii.1955 (*B. Stuckenberg*); Centre, Station Agric. Alaotra, 800 m., dct. Ambatondrazaka, 1 ♂, 1 ♀, 24.xii.57 (*B. Stuckenberg*); Ouest, Ranohira, 860 m., 4 ♀, 26.i-4.ii.58 (*B. Stuckenberg*); Sud-Ouest, Saint Augustin, 6 m., dct. Tulear, 1 ♂, 11-13.ii.58 (*B. Stuckenberg*).

*Paralimna (Oedenopiforma) argentea* sp. n.

Only one specimen of this most distinctive species, *Oedenops*-like in colouring but definitely a *Paralimna*, of the new subgenus *Oedenopiforma*. Easily distinguished from the other species of this subgenus *Paralimna madecassa* Soika, by the yellow face and greyish black antenna.

*Head*: antennal segments I and II dark, III with a pale pile, bristles on segment II very weak. Arista with seven to eight lateral hairs, latter short. Face a golden yellow with a very prominent carina. Two strong pairs of facials, as strong as frontal bristles plus three to four short hairs. Buccal bristle and setulae very short with relatively broad silver buccae. Frons buff-brown with only the slightest of dark gold-brown dusting. Postocular bristles minute.

*Thorax*: mesonotum buff-brown with the light golden brown dusting, this colouring extending onto the dorsal half of the mesopleuron. Rest of pleura grey. Scutellum of same colour as mesonotum.

*Legs*: fore legs dark grey dusted, except tarsi which are pale basally, becoming darker on apical segments. Fore femur has a row of very short close-set spines on the anteroventral face (cf. *Notiphila*). Middle and hind legs of a similar colouration to fore legs, hind tarsi paler than on anterior limbs.

*Wings*, membrane hyaline, veins pale yellow, first costal section with short spines on basal half. Halteres pale yellow on stem, white club.

*Abdomen*: totally silver dusted, only the faintest brownish tinge to the median area of segment two.

Small species, length of body 2 mm.

Holotype ♀. NIGERIA: Ilorin, 22.ii.1912 (*J. W. Scott-Macfie*) to B.M.(N.H.).

Subgenus *AFROLIMNA* sgen. n.

Type-species, *Paralimna carolinika* sp. n.

A most distinctive subgenus containing two species, *Paralimna carolinika*, confined to the African mainland, and *Paralimna keiseri* sp. n., found only on Madagascar.

The following characters will distinguish this subgenus: Face, buccae, mesopleura, and tibiae silver dusted, face and buccae rounded and bulbous. Eyes elliptical, bulbous, large in relation to size of head. Head cubiform, with short wide flattened carina separating antennae. Thorax without distinct vittae, pleura covered in a short pile. Scutellum laterally silvered at base. Abdomen without bicoloured fasciated pattern.

♂ genitalia very distinctive, external claspers very heavy (Text-fig. 58), not slender as in subgenus *Paralimna*. Aedeagus of *Paralimna* type but lateral claspers not fused dorsally, nor to each other.

*Paralimna (Afolimna) carolinika* sp. n.

(Text-figs. 42, 59)

Easily distinguished from the other species in this subgenus, *Paralimna keiseri* sp. n., by the silver notopleuron and lack of brown wing markings in the male.

♂ and ♀. *Head*: (Text-fig. 42) antenna black, segment III with pale pubescence. Arista with fourteen lateral hairs. Face and epistoma silver-grey, facial carina large, flattened and truncate, lightly dusted with yellowish grey and with a dark 'shadow', due to reduced density

of silver-grey pollen, below the carina, almost reaching the mouth edge. Facial series of one long weak seta and numerous short weak setae. Fronto-orbital angles velvety black, with a silver-grey area, bluish when viewed at an angle, on the inner edge. Two fronto-orbitals present, anterior twice as strong as posterior. Frons and vertex black, very lightly dusted with silver-grey. Labium and palpi brown, lightly silver dusted. Buccae silver dusted and bulbous and with a ventral fringe of long setae as well as the larger porrect bristle.

*Thorax*: blackish brown, lightened by a golden brown, dusting, the latter more dense and imparting a golden yellow colouration to the posterior edge of the mesonotum and the anterior portion of the scutellum. Darker areas of mesonotum with short black setulae. Notopleuron and mesopleuron silver-grey, dorsal sides of notopleuron edged in golden brown. Scutellum with area enclosed by bristles, both dorsally and laterally chocolate-brown, dusted lightly with gold, basal region silvered laterally. Pleura dark brown, excepting silver mesopleuron and golden sternopleuron.

*Legs*: coxae, femora and tibiae blackish brown dusted with silver, tarsi reddish yellow. Apical segments darker than basal. Fore femora with four posteroventral strong bristles.

*Wing* membrane hyaline with pale reddish yellow veins. Halteres, stem reddish yellow, club yellow.

*Abdomen*: covered in olivaceous grey pollen, anterior lateral edges of all tergites with slight brown areas, normal fasciated pattern absent. Silvered laterally on third and fourth segments in male, fourth and fifth in female. In male, fifth segment distinctly darker than preceding segments.

♂ genitalia (Text-fig. 59).

Holotype ♂. RHODESIA: Lower Lundi River, Chipinda pools, 22.x.60 (*R. Goodier*). B.M.(N.H.).

Paratypes. Data as type, 3 ♀; NIGERIA: Zungeru, 2 ♀, 19.iii.1911 (*J. W. S. Macfie*).

SUDAN: Yirol, 1 ♂, 28.ii.1954 (*E. T. M. Reid*). The above specimen from the Sudan has the golden dusting of the thorax in three distinct bands but differs in no other way. This species has a very wide range from Sudan in the North to Rhodesia in the South and extending westwards to Nigeria.

### *Paralimna (Afromimna) keiseri* sp. n.

One of the two colourful and interesting members of the subgenus *Afromimna*; like the mainland species the face and mesopleuron are silver, but the pleural stripe does not extend on to the mesonotum. In the male of this species the wing is strongly marked with brown.

♂. *Head*: antennae black. Arista with thirteen lateral hairs. Face strongly silvered, region around prominent, squarish upper facial carina not as strongly dusted and therefore darker. One strong facial bristle and about eight weak hairs. Lower facial region, below eye, brown dusted. Buccae silver with a pair of strong, subequal bristles plus numerous long forwardly directed hairlike bristles. One long posterior buccal bristle. Eyes bulbous, elliptical and large, cheeks relatively narrow. Vertex more sunken than usual. Velvet black irregular area around base of fronto-orbital. Frons shiny black with light dusting. A strong orbital bristle, just posterior to fronto-orbital. Frons and vertex region reduced in area.

*Thorax*: mesonotum black-brown with light golden brown dusting. Postnotopleural depression strongly golden dusted and two areas in scapular region grey dusted. Tip and dorsal surface of scutellum as notum, laterally, at base, silvered. Pleura grey, apart from mesopleuron which is brown in anterodorsal region and silver dusted over remainder.

*Legs*: fore legs grey with strong silver dusting. Femur with a posteroventral series of five or six long bristles, twice the width of the femur in length. Middle and hind legs dark with middle tibia strongly silvered on dorsal face, along complete length. Hind tibia not silvered on apical quarter, which is black. Middle femur with an apical anterior series of four to five strong bristles.

*Wing*: hyaline membrane, dark brown veins, an irregular brown patch just apical of midway in marginal and submarginal cells and extending as a diffuse brown mark into first posterior cell. Halteres dark at base, pale yellow on stem and club.

*Abdomen*: segment one dark brown, segment two with central two thirds greenish grey dusted and lateral edges silver, segment three as for two, but with anterior half of segment dark brown. Segment four same as three. Segment five dark brown.

♂ genitalia (Text-fig. 58).

Body length 4.5 mm.

♀. Wings lack brown patch.

Holotype ♂. MADAGASCAR: Sud, Sept-Lacs, 100 m., dct. Tuléar, 13-16.ii.58 (*B. Stuckenberg*). To N.M.

Paratypes. MADAGASCAR: Tan. Fenerive, 1 ♂, 4.xi.57 (*F. Keiser*); Sud, Sept-Lacs, 100 m., dct. Tuléar, 8 ♂, 10 ♀, 13-16.ii.58 (*B. Stuckenberg*); Centre, Station Agric. Alaotra, 800 m., dct. Ambatondrazaka, 1 ♂, 24.xii.57 (*B. Stuckenberg*); Ankavandra, Mamambolo, 2 ♀, vii.49 (*R.P.*), Inst. Sc. Mad.

The specimen from central Madagascar, although a ♂, has very reduced brown wing markings.

4 ♀ and 3 ♂ to B.M.(N.H.).

### Subgenus *PARALIMNA* s. str.

*Paralimna* Loew; Cresson, 1916 : 105.

*Poecilothorax* Becker; Cresson, 1929 : 187.

*Paralimna* Loew; Cresson, 1947 : 108.

The nominal subgenus of genus *Paralimna*, very diverse in form and easily divisible into seven distinct species groups. The characters given for the genus, plus the presence of a fasciated abdominal pattern will suffice in distinguishing members of this subgenus. The subgenera *Afrolimna* subgen. n. and *Oedenopiiforma* subgen. n. are distinguished from it by lack of abdominal pattern and predominantly silver-grey buccae and mesopleura.

The male genitalia, although basically similar, differs markedly in the shape and degree of development of the component sclerites. The complete genital armature is figured (Text-fig. 9).

### The *LIMBATA*-species group

Consists of three species in the Ethiopian region *Paralimna limbata* Loew, *Paralimna reticulata* sp. n. and *Paralimna aequalis* Cresson.

Head rather cubiform, face short with longitudinal shallow ridges and fronto-orbital bristles reduced. The third antennal segment is at least twice as long as broad. Originally designated as the subgenus *Phaiosterna* Cresson.

*Paralimna (Paralimna) aequalis* Cresson

(Text-figs. 4I, 54)

*Paralimna aequalis* Cresson, 1929 : 193.*Paralimna aequalis* Cresson; Cresson, 1948 : 10.*Paralimna vidua* Soika, 1956b : 124, **syn. n.**

This species is very variable in colour, ranging from a light olive green through golden brown to dark blackish brown, but is instantly recognizable by the almost unicolourous vestiture of the head and thorax, characteristic head shape (Text-fig. 4I), and the indistinct abdominal fasciated pattern.

Cresson placed this species in a separate subgenus *Phaiosterna* together with *Paralimna limbata* and *Paralimna decipiens* Loew. However, I have not followed this course, preferring instead to retain them in a separate species group.

The synonymy of *Paralimna vidua* Soika, is based upon a study of the type material from the Congo. Lamb's reference to *Paralimna lineata* Meij. from the Seychelles is probably correct, and *Paralimna aequalis* is a synonym of *Paralimna lineata* de Meijere, but I do not wish to state this synonymy at present.

♂. *Head*: antennae dark with some pale pubescence. Arista with seven to nine lateral hairs, segment III of antenna twice as long as wide and distinctly angular. Facial series of one to two long, and a variable series of shorter bristles together with a number of hairs. Facial carina slight, and lower face with slight horizontal indentations. One long buccal bristle and numerous hairs. The anterior fronto-orbital is inserted anterior to the frontal bristle.

*Thorax*: acrostichals in distinct, but irregular rows, wings with hyaline membrane and pale brown veins, and fore femora with a posteroventral series of short bristles along its length.

*Abdomen*: very indistinct pattern of dark brown and olive-grey; on segment two, narrowly, and segment five, broadly, are the grey fasciae complete.

♂ genitalia (Text-fig. 54).

♀ as for ♂, but on abdomen brown fasciae broader and grey interrupted on all segments.

Colouring varies according to region; West Africa, almost totally olivaceous; Congo, brown ochraceous; East Africa and Madagascar, more distinct frontal pattern with golden dusting on head and mesonotum. The specimens from the Aden Protectorate show a narrow median brown vitta on the mesonotum.

As I can detect no consistent genitalic differences I am considering all the colour varieties mentioned above as regional races. I have seen specimens from West Africa, the Congo, Madagascar and Seychelles, Sudan, Arabian Peninsula and Palestine, as well as from the Orient.

Material studied. MADAGASCAR: Sud-Ouest, Saint Augustin, 6 m., dct. Tuléar, 4 ♂, 6 ♀, 11-13.xi.58 (*B. Stuckenberg*); Nord, Diégo Suarez, 30 m., 2 ♂, 2 ♀, 4-9.xii.57 (*B. Stuckenberg*); Est, Ivontaka 15 m., dct. Mananara, 2 ♀, 10-14.iii.58 (*B. Stuckenberg*). Bas Mangoky, Station Agric., 1 ♀, Inst. Sc. Mad. GHANA: Neawani, 2 ♂, 8 ♀, 29.ix.21 (*J. W. Scott-Macfie*); Ashanti, Obuasi, 1 ♂, 3.iv.06 (*W. H. Graham*). SEYCHELLES Is: Mahé, 4 ♂, 08-9 (*J. S. Gardiner*); Lousin Is., 2 ♂, 2 ♀, 30.iii.52 (*E. S. Brown*). W. ADEN PROTECTORATE: Kirsh, c. 3,000 ft., 3♂, 3 ♀, 22.iii.1940 (*P. W. R. Petrie*) 'on camel near water holes'. CONGO: Kivu, Kavimvira (Uvira), 2 ♀, ii, iii.55 (*G. Marlier*), à la lumière, I.R.S.A.C.

*Paralimna (Paralimna) limbata* Loew

(Pl. I, fig. 1, Text-fig. 73)

*Paralimna limbata* Loew, 1862 : 13.*Paralimna limbata* Loew; Cresson, 1929 : 188.*Paralimna limbata* Loew; Cresson, 1947 : 115.*Paralimna limbata* Loew; Soika, 1956a : 495.

In colour and form very similar to *Paralimna reticulata* but easily distinguished from it by the absence of wing pattern and black fronto-vertical patches. Cresson appeared confused over his conception of this species, referring to it as almost unicolourous in the same paper as describing the well marked throacic and frontal vittae (Cresson, 1947).

*Head*: antennal segments I and II dark, III buff-brown, twice as long as wide. Arista with eleven to thirteen lateral hairs. Face pale yellow to olive, with variable brown markings, facial series of one stronger bristle and one short weak bristle. Buccae with two strong subequal bristles both stronger than the facials, only three to four short bristles on buccae. Frons ochraceous with a broad median longitudinal vitta, purplish brown in colour and two short vittae extending from vertex to fronto-orbitals along orbital edge of same colour.

*Thorax*: mesonotum buff to olive-brown with a broad median vitta, plus three pairs of narrower vittae all of purplish brown. Mesopleura with two narrow vittae of similar colour to those on mesonotum. Rest of pleura grey-green. Scutellum with one central vitta.

*Legs*: tarsi pale, otherwise legs dark greyish brown. No male fore femoral comb.

*Wings*, with membrane hyaline, veins dark brown, hind cross vein clouded (Pl. I, fig. 1).

*Abdomen*: grey fascia interrupted by median brown vitta on all segments but segment two in the male, on all segments in the female. Pattern of grey and brown fasciae less distinct in this species. Some specimens have the frontal and pleural vittae reduced and the wing veins slightly clouded along their lengths. They appear to differ in no other way. External claspers as Text-figure 73.

CAMEROONS: Kumbu, 5 ♂, 8 ♀, 6.x.49 (*H. Oldroyd*). UGANDA: Katosi, 3 ♂, 20.ix.36 (*E. G. Gibbins*), on debris at lake edge. ZAMBIA: Nr. Monze, x.1959. S. AFRICA: Pondoland, Port St. Johns, 1 ♀, v.1924 (*R. E. Turner*). SUDAN: Yirol, 1 ♂, 28.iii.54 (*E. T. M. Reid*). GHANA: Koforidua, 1 ♂, 2 ♀, 5.vii.1919 (*F. H. Storey*). MOZAMBIQUE: Lower Zambesi River, Marraneu, 1 ♀, xi.1957 (*P. J. Usher*); Lower Zambesi River, Luabo, 1 ♀, iv.1958 (*P. J. Usher*); Lower Zambesi River, Luabo, 1 ♂, i.1956 (*P. J. Usher*); Chupanga, Salowe Forest, 1 ♂, i.1956 (*P. J. Usher*). LIBERIA: Cape Mount Co. Dia, 2 ♂, 3 ♀, 2.17.53-25, Sandy bank (*C. Blickenstaff*). ETHIOPIA: Gila River Mission Station, 1 ♀, ix.1963 (*M. L. Schmidt*). CONGO: Plaine Herbeuse près de Mwashia, 1 km. de la saline, 1 ♂, 1 ♀, 3.v.39 (*H. J. Bredo*). I.R.S.N.; Elizabethville, 1 ♀, 30.iii.39 (*H. J. Bredo*); à la lumière, I.R.S.N.; Liberge, Savane Liki-Bembe, 1 ♀, 27.ii.48 (*R. Cremer, M. Neuman*), I.R.S.N.; Eaja, 1 ♂, vii.1935 (*J. Ghesquière*). I.R.S.N.

In the specimens from Mozambique and Luabo (i.1956), the wings are almost totally infumated, with pale areas around the costal rim and in the discal and second posterior cell. This rather distinctive form may represent a distinct subspecies but I refrain from describing it as such until further material can be obtained.



*Paralimna (Paralimna) reticulata* sp. n.

(Pl. 1, fig. 2, Text-figs. 41, 52)

One of the most outstanding and easily distinguishable species in the genus, belonging to the *limbata* group. The body pattern of this species is very similar to that of *Paralimna limbata* but *P. reticulata* differs most strikingly in wing and head markings. There is far more brown on the abdomen than in *Paralimna limbata*, where at least half the tergite is fasciated.

♂ and ♀. *Head*: antennal segments I and II pale, with light grey dusting, segment III more than twice as long as broad, pale with dorsal darkening, at point of insertion into II, a distinct pale mauve shine. Arista with eleven lateral rays. Face short, golden dusted with slight lateral groove at ventral third. Brown patches on lower half of face. A single long curved facial bristle. Cheeks and parafacials grey, buccae dark brown. Buccal bristle long and slender and long subequal bristle and several short hairs. Epistoma gold dusted and receding. Frons 'golden' yellow-brown with velvety texture, two iridescent patches, (turquoise-blue to dark purple, depending on angle of observation) on anterior edge of frons plus two velvet black rectangular patches, between main fronto-orbital and vertical bristles. Head bristles normal, second small anterior fronto-orbital. Eyes large and bulbous.

*Thorax*: notum, pleura and scutellum all dark reddish brown with one median, and two lateral pairs of dark golden vittae on the mesonotum, and three longitudinal vittae on the pleura. Dorsal and ventral broad vittae and a median, more indistinct, narrower band passing along the base of the mesopleural sclerite.

*Legs*, except for the tarsi and the apex of the fore tibia, dark blackish brown. Fore tarsal segments one and two pale orange-yellow, plus metatarsi on other legs, rest dark brown. Setulation normal. Hind metatarsus with strong yellow scopa.

*Wings*, dark veins bordered completely by brown shadowing, and all cells with brown patches; (Pl. 1, fig. 2). Halteres pale yellow, base darker.

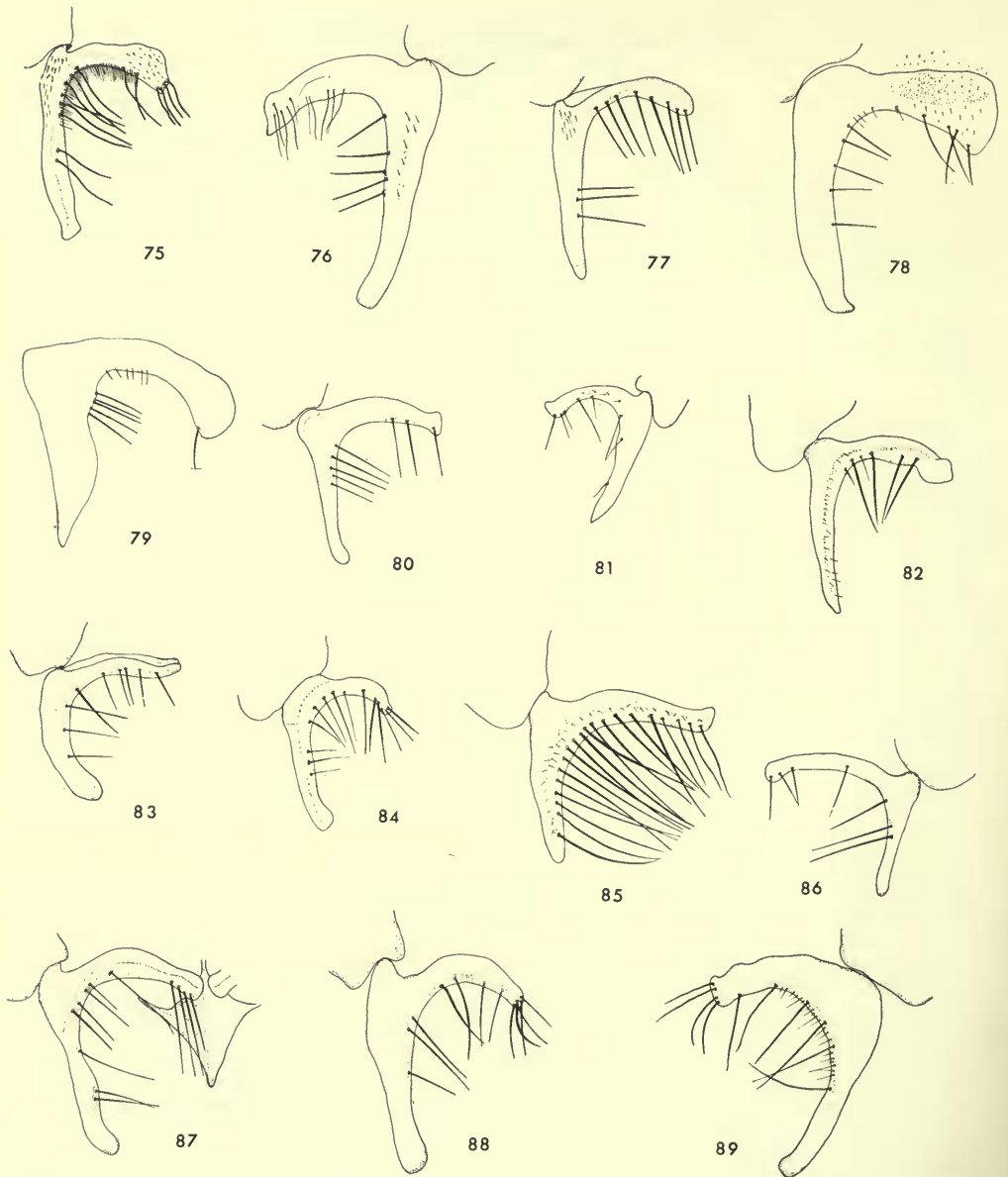
*Abdomen*: dark brown with yellow fasciae laterally and extending on posterior third of each tergite over only one third width of the segment.

Holotype ♂. MADAGASCAR: Ouest, Ranoshira 860 m., 26.i.-4.ii.58 (*B. Stuckenberg*). To N.M.

Paratypes. MADAGASCAR: Andobo, 190 m., Forêt Antsingy, dct. Antsalova, 3 ♀, 2 ♂, ii.57 (*P. Griv.*), Inst. Scientifique Mad.; Ranomafana, Ifanadiana, 1 ♂, Institut Scientifique Madagascar; Est, Ivontaka 15 m., dct. Mananara, 1 ♂, 10-14.iii.58 (*B. Stuckenberg*); Est, Ambodivoangy, 20 m., dct. Maroantsetra, 3 ♂, 16-20.iii.58 (*B. Stuckenberg*); Sambirano, Lokobe, Nossi-Bé, 1 ♀, 9-23.xi.57 (*B. Stuckenberg*); Ouest, Ranohira, 860 m., 7 ♂, 17 ♀, 26.i.-4.ii.58 (*B. Stuckenberg*); Maj. Amboromalandy, 1 ♂, 5 ♀, 2.vii.58 (*F. Keiser*); Maj. Amborovy, 1 ♂, 6 ♀, 30.vi.58 (*F. Keiser*); Maj. Amborovy, 1 ♂, 2 ♀, 29.vi.58 (*F. Keiser*).

The *NIGRIPES*-species group

Face wide in relation to depth and usually with strong facial bristle series. Male fore femoral armature strong.



FIGS. 75-89. Single ♂ external claspers of *Paralimna* spp.: 75, *P. pokuma* Cresson; 76, *P. monstruosa* Soika; 77, *P. nebulosa* Wirth; 78, *P. arabica nubifer* Cresson; 79, *P. arabica ugandensis* subsp. n.; 80, *P. lynx* Cresson; 81, *P. poecila* Wirth; 82, *P. puncticollis* Becker; 83, *P. invisus* Soika; 84, *P. cruciata* sp. n.; 85, *P. dorina* sp. n.; 86, *P. adversa* Cresson; 87, *P. nigripes* Adams; 88, *P. setifemur* Cresson; 89, *P. mariae* sp. n.

*Paralimna (Paralimna) nigripes* Adams

(Text-figs. 38, 87)

- Paralimna nigripes* Adams, 1905 : 178.  
*Paralimna nigripes* Adams; Bezzi, 1914 : 307.  
*Paralimna nigripes* Adams; Cresson 1929 : 186.  
*Paralimna nigripes* Adams; Cresson, 1947 : 108.  
*Paralimna nigripes* Adams; Wirth, 1956 : 384.  
*Paralimna nigripes* Adams; Soika, 1956 : 492.

Similar in colouring and form to *Paralimna setifemur* and *Paralimna puncticollis* but darker than the latter, with male fore femora strongly 'combed'. *Paralimna setifemur* has characteristic male fore femoral setae and pale mesopleurae. Closely related to *Paralimna cruciata* sp. n. and *Paralimna mariae* but easily distinguished from both by facial colouration.

*Head*: antennal segments I and II dark, segment III with short grey and long sparse pale pubescence. Arista with ten lateral hairs. Dorsal face dark brown between antennae, lightening ventrally, becoming grey on lower half. Two to three strong facials plus a number of weak setae, buccae pale brown, darker just ventral to the eye, two strong porrect buccal bristles, numerous short setae. Frons dark brown with sparse golden brown patterning. Median vertical stripe often present.

*Thorax*: mesonotal ground-colour pale brown, heavily darkened with brown laterally. Scutellum of similar colouration. Pleura dark brown, except metapleuron which has some grey dusting.

All legs dark, fore femora of male with a long series of strongly flattened and curved setae, fourteen in number.

*Wing* membrane hyaline, slightly infumated along costa, more so in marginal and submarginal cells.

*Abdomen*: grey fasciae divided by median dark brown vitta on all segments but segment two. No darkening of posterior two segments in male. Male genitalia, large and heavily chitinized (Text-fig. 87).

A very common species, I have seen specimens from Nigeria, Congo, Kenya and South Africa.

From the original co-typic series of 10 specimens I have designated the following male specimen as LECTOTYPE.

LECTOTYPE ♂. S. AFRICA: Salisbury, 5050 ft., vi.1900 (*F. L. Snow*).

Paralectotypes, data as for Lectotype, 3 ♂, 6 ♀. All types have been returned to the University of Kansas, Lawrence, Kansas.

Material studied. SOUTH AFRICA: Natal, Weenen, 6 ♂, 20 ♀, xii.1923 (*H. P. Thomasset*); Natal, Weenen, 2 ♂, 4 ♀, iii.1925 (*H. P. Thomasset*); Natal, Muden, 1 ♂, 2 ♀, 1.x.56 (*B. Stuckenberg*); Pretoria, 1 ♀, vi.48 (*W. P.*); Port St. Johns, Pondoland, 1 ♀, 18-31.iii.1924 (*R. E. Turner*); Natal, Ndwedwe Dist. Montebello Region, 5 ♂, 4 ♀, 1.x.61 (*B. & P. Stuckenberg*); Natal, Drakensberg, Giants Castle Res., 2 ♀, 18-23.ix.61 (*B. & P. Stuckenberg*). KENYA: Nairobi, 1 ♂, vii.1930 (*Van Someren*); Mdagathi, 1 ♂, iv.33 (*Van Someren*); Ngong, 1 ♂, viii.48 (*Van Someren*); Nyerei (S), 1 ♂, x.48 (*Van Someren*). RHODESIA: Umtali, 3 ♀, ix.27 (*A. Cuthbertson*). ZAMBIA: Chilanga, 1 ♀, 21.v.13 (*R. C. Wood*), on wet ground by stream.

UGANDA: Katosi, 1 ♀, 20.ix.1936 (*E. G. Gibbins*), on debris at edge of lake.  
 NIGERIA: Zungeru, 1 ♀, 23.ii.11 (*J. W. S. Macfie*). MADAGASCAR: Ouest, Ranohira, 860 m., 1 ♀, 26.i.-4.ii.58 (*B. Stuckenberg*). MOZAMBIQUE: Lower Zambesi River, Luabo, 1 ♀, viii.1957 (*P. J. Usher*). CONGO: Katanga, Teuhe, 30.vii-9.vii.1931 (*T. D. A. Cockerell*); Plaine herbeuse près de Mwashia, 1 km. de la Saline, 5 ♂, 3 ♀, 3.v.39 (*H. J. Bredo*), I.R.S.N.; Marais Kalula, 1 ♂, 1 ♀, 3.v.39 (*H. J. Bredo*), I.R.S.N.; Liberge vallée, Liki Bembe, Bavula, 1 ♀, 28.ii.48 (*S. Esobe, R. Cremer, M. Neuman*), I.R.S.N.; Bafwasende, 1 ♀, 18.xii.36 (*J. Ghesquière*), I.R.S.N.; Terr. Rutshuru, 3 ♀, vii.1937, Mission Prophylactique; Rutshuru, 1 ♂, 2 ♀, 17.v.36 (*L. Lippens*); Rutshuru, 1 ♀, ix-x.1936 (*Delville*); Rutshuru, Fuku, 1 ♂ 15.v.36 (*L. Lippens*); Kalembelembe, Baruka, 1 ♂, 4 ♀, vii.18 (*R. Mayne*); Nyangwe, 3 ♂, 10 ♀, iv-v.1918 (*R. Mayne*); Uele-Aba, 1 ♀, 30.ii.14 (*Don and Laree*); Zambi, 1 ♀, ii-iii.1937 (*Darteville*); Uvira, 1 ♀, x.22; Lomami, Kambaye, 1 ♀, x.1930 (*P. Quane*); Ubargi Dula, 1 ♂, 17-19.i.32 (*H. J. Bredo*); Kissenyi, 1 ♂, 5.vi.55 (*F. François*).

***Paralimna (Paralimna) nigripes bona* Cresson ssp. rev.**

*Paralimna bona* Cresson, 1933 : 29.

*Paralimna bona* Cresson, 1947 : 110.

*Paralimna bona* Cresson; Wirth, 1955 : 54.

*Paralimna nigripes* Adams; Soika, 1956a : 492.

Very closely related to *Paralimna nigripes* Adams, resembling it in almost all the diagnostic characters, apart from the absence of brown buccae and the reduction of the amount of brown on the mesonotum and mesopleuron. The colour of the buccae and pleura is usually a sound character in this genus, more trustworthy than many bristle characters. The genitalia are only different in slight but consistent ways. The reason for Soika's synonymy may be due to the fact that Cresson wrongly labelled a specimen of *Paralimna nigripes* as *Paralimna bona*, the correctly recorded specimen being placed with the type and the misnamed specimen.

Recorded from LIBERIA, KENYA and SOUTH AFRICA (Natal).

***Paralimna (Paralimna) setifemur* Cresson**

(Text-figs. 45, 88)

*Paralimna setifemur* Cresson, 1939 : 10.

*Paralimna setifemur* Cresson; Soika, 1956a : 494.

A large species most closely related to *Paralimna nigripes* Adams, with a distinctive character in the spination of the fore femora, more markedly so in the male than the female. Face darker than *Paralimna nigripes* due to pale brown infusion and with two or more strong porrect facials. Both buccae and mesopleura have some dark brown dusting, but neither are predominantly dark.

♂. *Head*: antennal segment III twice as long as broad, greyish. Arista with fourteen to fifteen lateral hairs. Face in profile strongly curved in dorsal half, but carina not distinct. Face predominantly brown with a number of short bristles and hairs and a median dark brown

line extending almost to ventral edge. Two very strong, and one weaker bristle, widely spaced, and inserted more ventrally than in *Paralimna arabica* Becker. Buccae grey with slight brown darkening, buccal bristle relatively weak and curved.

*Thorax*: mesonotum grey, with dark brown vittae and strong irroration. Pleura grey, some brown on meso- and sternopleuron.

*Legs*. Middle and hind tarsi pale, rest dark with strong grey dusting. Fore femora with a single row of closely set short bristles on anteroventral face, equivalent to normal male comb. Posteroventrally is a row of more closely and irregularly set longer bristles along the complete length. Fore tibiae clothed on ventral surface with short, dense setae.

*Wings* hyaline.

*Abdomen*: abdominal segment two with complete grey fascia, on all the others grey, interrupted by median brown vitta.

Male genitalia (Text-figs. 45, 88) large and strongly chitinized.

♀. Face less dark, only two strong facial bristles, and abdominal segment two with incomplete grey fascia. Fore femoral series of similar form to male but all bristles appreciably shorter.

Unfortunately the type appears lost, but there are three other specimens, all from Kenya, in B.M.(N.H.).

Material studied. KENYA: Lake Jipe, 1 ♂, viii.47 (*Van Someren*); Nyeri (S), 1 ♀, vi.49 (*Van Someren*); Nairobi, 1 ♂, vii.30 (*Van Someren*). MOZAMBIQUE: Lower Zambesi River, Luabo, 1 ♀ (*P. J. Usher*). CONGO: Plaine herbeuse près de Mwashia, 1 km., de la saline, 2 ♂, 1 ♀, 3.v.39 (*H. J. Bredo*), I.R.S.N.; Terr. Rutshuru, 1 ♂, 1 ♀, 30.vii.37, Mission Prophylactique.

### *Paralimna (Paralimna) puncticollis* Becker

(Text-figs. 46, 82)

*Paralimna puncticollis* Becker, 1923 : 72 (♀).

*Poecilothorax angustus* (Becker) Cresson, 1929 : 187 (♂).

*Paralimna puncticollis* Becker; Cresson, 1947 : 109.

*Paralimna puncticollis* Becker; Wirth, 1956 : 384.

*Paralimna puncticollis* Becker; Soika, 1956a : 494.

*Paralimna puncticollis* Becker; Wirth, 1960 : 394.

Apart from the lighter ventral face, grey lateral band on mesonotum and pale tarsi, very similar to *Paralimna nigripes* Adams. Differs from *Paralimna poecila* Wirth, in facial colour and possession of fore femoral comb.

♀. *Head*: antennal segments I and II dark, III with short brown and long pale pubescence. Arista with fourteen lateral hairs. On carina and between antennal foveae dark brown, remainder of face silver-grey. At least three strong curved bristles, more in the South African form, plus two to three short setulae. Buccae dark brown with numerous setae and one short porrect bristle. Frons patterned in light and darker brown, setation normal.

*Thorax*: mesonotal ground colour light greyish buff, with a pair of median brown vittae and light irroration, laterally grey, scutellum same. Metapleuron grey, other pleurae dark brown.

*Legs*: all tarsi pale, legs dark blackish brown.

Wing membrane hyaline, veins yellowish brown.

*Abdomen*: ♀, grey fasciae broad, greater than half of the segment, divided medially on segments three to five by median brown vitta, brown fasciae very narrow and short on segment

two. The male allotype of *P. angustus* Becker is this species, with the same data as the above ♀ type. Nine to ten short curved and flattened setae in middle half of anteroventral face of fore femora, fore tibia quite strongly curved. Male abdominal segment two, as in female, three similar to two, four and five generally darkened when viewed caudally, and with narrow and divided grey fasciae.

Male genitalia (Text-figs. 46, 82).

♂ length 2.0 mm. (♀ 4.0 mm.).

Type specimens of both species from Khartum [*sic*], Aegypt, Sudan (*Ebner*), 16.ix.1914. Zool. Garten. Vienna Museum.

In the collections I have studied, a rare species. The specimens recorded from Ngong, Cresson, 1947, are not typical, and I am doubtful of their conspecificity.

Material studied. SOUTH AFRICA: Transvaal, Skukuza, 3 ♂, 2 ♀, 23.xi.59 (*B. Stuckenberg*); Pretoria, 1 ♀, v.1948 (*J.C.F.*). MOZAMBIQUE: Luabo, 3 ♂, 3 ♀, i.1956 (*P. Usher*); Lower Zambesi River, Luabo, 2 ♂, 3 ♀, 1.v.58 (*P. Usher*). RHODESIA: Salisbury, Dept. Agric., 1 ♀, ii.1932 (*N.Y.*).

A series from the Congo have more yellowish faces and resemble *Paralimna poecila* Wirth, apart from possessing male fore femoral combs.

### *Paralimna (Paralimna) poecila* Wirth

(Text-fig. 81)

*Paralimna poecila* Wirth, 1964 : 3.

A small species, of which I have seen only a male paratype. Very similar to *Paralimna nidor* Cresson, in having very reduced male fore femoral comb, but mesonotal colouring resembles that of *Paralimna puncticollis* Becker, to which it also bears some resemblance in abdominal pattern.

There is little to add to Wirth's full description but comment may be made of the fact that *Paralimna nidor* Cresson, is included in the comparison on p. 385 as having a male fore femoral comb, which it has not, thereby separating this species more strongly than is the case. This species may be identified on the following characters:

Small size, yellow face with rather weak facials, buccae dark brown with a single porrect bristle. Mesonotum vittate and irrorate with dark brown on buff-brown, laterally grey. Pleura dark brown excepting metapleuron. Legs dark, palpi pale. A long series of very short hairlike setae on anteroventral face of fore femora of male. Wings with a hyaline membrane, hind cross vein slightly darkened. Abdominal segment two has a complete grey fascia, it is interrupted on other segments. Last two segments distinctly darkened, in male.

S. Rhodesia is the only area from which this species has so far been recorded.

The male genitalia (Text-fig. 81) are very similar to *Paralimna puncticollis* Becker, and the two species are obviously very closely related. However, the absence of a male femoral comb is a character which, on present evidence, is sufficient to separate the species.

*Paralimna (Paralimna) cruciata* sp. n.

(Text-figs. 50, 84)

A large species, closely related to *Paralimna nigripes* Adams, but differing from it in facial and pleural colouration, and cruciate ocellar bristles of male.

♂. *Head*: antennal segments I and II dark with golden brown dusting, segment III off-white due to dense covering of short pile and fewer long hairs. Arista with twelve lateral hairs. Face silver-grey, apart from golden brown lateral regions and central carina on which the brown colouration extends two thirds of facial length. Buccae are silver-grey with heavy golden brown dusting. Facial series consists of one strong dorsal bristle and eight or more weaker bristles. One long buccal bristle and a shorter weaker bristle ventral to it plus numerous short buccal bristles. No outstanding posterior buccal bristle. Frons with median stripe from ocellar triangle, divided longitudinally, joining a broad band along the anterior edge of the frons. The whole frons changes in colour depending on angle of light. One half of the frons and the opposite half of the dividing bands alternate, with the reverse pair, from golden brown to blackish brown. Ocellar bristles short and cruciate above the anterior ocellus.

*Thorax*: mesonotum dark brown mottled with golden brown, an indistinct median dark brown vitta, sides of mesonotum, lateral to supra-alars and presuturals, grey. Sides of scutellum grey. Pleurae light brown with the lateral grey of mesonotum extending as a narrow band on to mesopleuron. Ventrally, pleura grey-brown.

*Legs* apart from tarsi dark, fore and hind tarsi dark, but with dense golden yellow ventral hairs. Fore femora with fifteen to sixteen long flat curved hairs on the anteroventral face.

*Wing* membrane hyaline, halteres pale lemon-yellow.

*Abdomen*: with a median broad vitta on segments three to five and lateral brown fasciae on the anterior half of all segments. Genitalia as Text-figs. 50, 84.

♀. Differs from ♂ in having larger, but reclinate, ocellar bristles. Grey lateral regions of mesonotum reduced in area, or absent. Frontal pattern variable but always with a 'changing' pattern.

Holotype ♂. MADAGASCAR: Soubirano, Lokobe, Nossi-Bé, 6 m., 1 ♂, 9-23.xi.57 (*B. Stuckenberg*).

Paratypes. MADAGASCAR: Soubirano, Lokobe, Nossi-Bé, 9 ♂, 9 ♀, 9-23.xi.57 (*B. Stuckenberg*); Ouest, Ranohira, 860 m., 2 ♂, 1 ♀, 26.i.-4.ii.58 (*B. Stuckenberg*); Fia, Ranohira, 1 ♀, 7.iii.58 (*F. Keiser*).

Type to N.M., one paratype to Basle; 4 ♂ and 3 ♀ paratypes to B.M.(N.H.) and remaining paratypes to N.M.

*Paralimna (Paralimna) mariae* sp. n.

(Text-fig. 89)

Very similar in colouring and pattern to *Paralimna cruciata* sp. n. but differs in lacking the cruciate ocellars and has both fronto-orbitals strongly developed.

♂. *Head*: antennal segments I and II dark with golden brown dusting, segment III pale due to extensive dense pale pubescence. Arista with ten lateral hairs. Face grey between facial series, brown laterally extending from around base of facials and parafacials to mouth edge. Central carina broad and irregularly darkened with brown. Area of buccal bristles dark brown, small bare area ventral to eye and extending on to buccae, grey. Facial series

consisting of one very strong, long curved bristle widely separated from the rest of the series, which consist of two strong and numerous weak bristles. Epistoma prominent and brown. Two to three short but strong porrect buccal bristles. Frons generally dark with slight patterning, the latter consisting of small light grey and brown patches, only area anterior to frontal bristles with numerous short setulae. Centre of frons with a large round indistinct velvet black spot, just anterior to ocellar triangle. Fronto-orbital bristles well developed, anterior only a little longer than posterior but appreciably stronger.

*Thorax*: mesonotum grey with strong irrorations and two broad irregular vittae running along the lines of the dorsocentrals, numerous short irregularly arranged vittae coalesce with the median vittae over the posterior half. Mesonotum laterally grey. Scutellum grey on the sides and edges of the disc, latter dark brown. Pleura grey with irregular dark brown patches on the meso-, ptero- and sternopleura.

All legs predominantly dark with some paleness on the tarsi, together with the golden ventral fringes on the hind tarsi. Fore femur with nineteen to twenty curved flattened setae on the antero-ventral surface.

*Wing* membrane hyaline with dark black-brown veins, some brown dusting on extreme base. Basal costal section with strong bristles.

*Abdomen*: grey lateral fasciae on all segments, delimiting the median brown vitta, latter very narrow on segment two, grey fasciae broadly expanded lateroventrally on segments.

♀ More brown on pleura, less grey laterally on mesonotum, face with more brown. Posterior fronto-orbital bristle shorter in proportion to anterior bristle. Grey fasciae on abdomen broader and median brown vitta strongly constricted on all segments, disjointed on segment two.

There are minor differences in male genitalia between this species and *Paralimna cruciata* sp. n., the latter the Malagasy form of *Paralimna maria* (Text-fig. 89).

Material studied. Holotype ♂ (one wing missing). SOUTH AFRICA: Witsands Dunes, Cape Peninsula, 25-16.ix.1959 (B. & P. Stuckenberg), to N.M.

Paratypes. 1 ♀, data as type, to B.M.(N.H.); SOUTH AFRICA: Cape Province, Paarl, 1 ♀, 24.x.54, S.A.Inst.Med.Res.; Cape Province, Cape Peninsula, Hout Bay, Skoorsteenkop, 26.xii.50 (*Brinck-Rudebeck*), in insect trap, No. 93, Swedish S. Africa Exp. 1950-1951. To N.R.S.

### ***Paralimna (Paralimna) dorina* sp. n.**

(Text-fig. 85)

In form resembling a large *Paralimna nidor* and referred to by Cresson (1947 : 110) as that species, but differing in possessing a comb of widely separated and narrowly flattened bristles on the fore femora of the male. The male genitalia bear a considerable resemblance to those of *Paralimna nigripes* (Text-fig. 85).

♂. *Head*: antennal segments I and II dark blackish brown, segment III paler, due to whitish pubescence. Arista with eleven to twelve lateral hairs. Face dark brown, pollinose with varying amounts of golden brown pollen. Three strong facials plus numerous shorter and weaker facial bristles and hairs. Central keel on dorsal half of face only, ventral portion flattened (cf. *sponsa* and *nidor*). Buccal bristle long, three to four porrect weak bristles and numerous short decumbent setae. Frons dark brown patterned with golden brown, all frontal bristles present, posterior fronto-orbital short and weak.

*Thorax*: mesonotum pale golden brown with three dark reddish brown vittae, one median, and a pair along the line of the dorsocentrals. Supra-alar depression pale greyish brown. Pleura dark reddish brown, metapleura greyish brown.



*Legs*: tarsi pale, remainder of legs blackish brown. Fore femora with eleven to twelve flattened curved bristles widely separated at their bases.

*Wings* with membrane hyaline and veins dark brown, infumated along their lengths.

*Abdomen*: fasciae over posterior half of each segment, and median brown vitta interrupted only on segment two.

♀. Very similar to ♂ but mesonotum laterally more grey dusted.

Holotype ♂. KENYA: Ngong, v. 45 (*Van Someren*), to B.M.(N.H.).

Paratypes. 1 ♂, 6 ♀, same data, to B.M.(N.H.).

### *Paralimna (Paralimna) dorina rhodesiensis* ssp. n.

Similar in general form to the nominal subspecies but differing in the following way:

♂. Face generally paler, sufficiently so to enable the median brown line to be visible, facial protuberance large, tending to displace the antennae dorsally, and it is possible that some difficulty may be experienced in placing this species in the correct group on antennal position, in relation to the dorsal edge of eye. Facial series of two long, rather weak bristles, one of half the length, and numerous shorter very weak bristles. Two longer subequal and numerous very short decumbent buccal bristles. Frontal region pale with characteristic labyrinthine pattern, the anterior frontal bristle just posterior to anterior orbital in the type but not in the other male.

Fore femoral armature of male similar in form but flattened bristles slightly shorter. Tarsi on all legs pale. Wing membrane totally hyaline and veins pale reddish yellow.

♀. Similar to ♂ in most respects, generally slightly darker in facial colour.

Described here as a separate subspecies due to the rather obvious differences in facial and wing colouring, facial form and very small genitalic differences.

Holotype ♂. RHODESIA: Salisbury (Nlei or Uhi), 20.i.10 (Collector ?) (N.Y.).

Paratypes. RHODESIA: Salisbury, (Nlei or Uhi), 1 ♂, 20.i.10 to B.M.(N.H.); Salisbury, (Nlei or Uhi), 2 ♀, 20.i.10, B.M.(N.H.) and N.Y.; Salisbury, 1 ♀, xii.1934 (*A. Cuthbertson*), B.M.(N.H.).

### *Paralimna (Paralimna) insolida* sp. n.

Body form as in *Paralimna puncticollis* Becker, but appreciably darker, only partially white dusted on face. In colouring very similar to *Paralimna sponsa* Soika, but differs in facial form and fore femoral armature of male.

♂. *Head*: antennal segments I and II grey blackish brown, segment III grey due to dusting. Arista with ten lateral hairs. Brown of face extending as grey vitta halfway down face. Latter very sparsely white dusted, having a teneral appearance. Facial series of one very long bristle and a number of shorter weaker hairs. Lateral areas of face, laterally on epistoma, and buccae brown. Latter with one strong bristle and a few short decumbent bristles. Frons and vertex brown, anterior fronto-orbital and frontal inserted laterally to each other. Outer vertical reclinate and posteriorly directed rather than outcurved.

*Thorax*: almost totally pale brown, slightly more grey laterally on the mesonotum and metanotum and with two or four narrow pale interrupted vittae on the central region of mesonotum between the dorsocentrals.

*Legs* totally pale brown, fore femora with eight to nine flattened curved setae and four to five slightly curved and flattened setae over basal half.

*Wing* with membrane totally hyaline.

*Abdomen*: with the grey posterior portion of fasciated pattern broadly interrupted on all segments.

Holotype ♂. CONGO: Elizabethville, 31.vii.1932 (*De Loose*).

Paratype. CONGO: Udangi Dula, 1 ♂, 17-19.i.1932 (*H. J. Bredo*).

Type material to M.R.A.C.

### *Paralimna (Paralimna) uelensis* sp. n.

Most closely related to *Paralimna nigripes* Adams but possessing the following distinguishing characters:

*Head*: antennae blackish with some pale pubescence on segment III. Arista with ten lateral hairs. Interantennal carina pale brown, rest of face grey. One strong curved facial, one or two shorter bristles and five to six short, weak hairs in facial series, slight brown dusting around base of facial bristles. Buccae grey, weakly haired with few hairs on the disc. Frons brown, frontal inserted posterior to anterior fronto-orbital.

*Thorax*: pleura grey. Mesopleuron with central brown area, mesonotum predominantly grey but with three narrow brown vittae between the dorsocentrals and scattered lateral patches of brown dusting.

*Legs* blackish brown with grey dusting, tarsi and trochanters pale. Fore femoral armature of male consists of thirteen to fourteen flattened curved bristles and four to five slightly flattened and curved bristles over the basal half.

*Wings* with membrane hyaline.

*Abdomen*: with usual fasciated pattern, posterior grey half of segments only complete on second segment, interrupted medially on remaining segments by brown vitta.

♀. More brown dusting on mesonotum and on mesopleuron.

Holotype ♂. CONGO: Uele, Gangala na Bodio, 15.iv.36 (*L. Lippens*) to M.R.A.C.

Paratypes. CONGO: Uele, Gangala na Bodio, 1 ♀, 14.v.36 (*L. Lippens*) to M.R.A.C.; Uele, Gangala na Bodio, 1 ♀, 15.v.36 (*L. Lippens*) to B.M.(N.H.); Haut Uele, Paulis, 1 ♀, v.47 (*P. L. G. Benoit*) to M.R.A.C.

### *Paralimna (Paralimna) adversa* Cresson sp. rev.

(Text-fig. 86)

*Paralimna adversa* Cresson, 1933 : 28.

*Paralimna adversa* Cresson; Cresson, 1947 : 110.

*Paralimna nigripes* Adams; Soika, 1956a : 492.

A small species from West Africa very closely related to *Paralimna nigripes* Adams, but in my opinion specifically distinct. In common with *Paralimna nigripes bona* Cresson, the buccae and pleura are only lightly marked with brown. Most easily distinguished from all three subspecies of *Paralimna nigripes* by the position of the frontal bristle in relation to the fronto-orbitals, the latter being well anterior to the anterior fronto-orbital bristle. Male genitalia as in Text-fig. 86.

I have seen no specimens other than the type series.

*Paralimna (Paralimna) invis* Soika

(Text-fig. 83)

*Paralimna invis* Soika, 1956b : 124.

A difficult species to differentiate, without outstanding characters, with the possible exception of the male fore femoral armature of ten to twelve short flattened setae. The face is darker than *Paralimna puncticollis* Becker, but in other respects closely resembles this species.

♂. *Head*: antennae segments I and II dark, segment III paler and arista with eleven lateral hairs. Face golden brown with a darker brown crescent between the buccal angles. Facial series of numerous weak and at least one strong bristle. Buccae dark brown with a small grey area ventral to the orbit. Frons with basic ground colour of golden brown, two darker bands broad at frontal suture, narrowing strongly and fusing posteriorly to ocellar prominence. Occiput grey. Fronto-orbital just anterior to frontal bristle.

*Thorax*: mesonotal ground colour light golden brown, becoming grey laterally. Three median vittae of dark brown between dorsocentrals, the central vitta two thirds width of lateral. Grey pollen on humeral region and extending posteriorly onto notopleuron. Scutellum brown on disc and apically, grey laterally except at apex. Mesopleuron dorsally brown remainder and sternopleuron greyish brown.

*Legs*: femora and tibiae dark, tarsi pale. Fore femora with ten to twelve short, less than width of femur, flattened setae, tips of the more apical flattened and curved.

*Wing* membrane hyaline, veins pale brown. Halteres pale yellow.

*Abdomen*: apart from segment one which is predominantly grey, the grey fasciae are reduced and restricted to lateral and posterior thirds of segments. External claspers as Text-fig. 83. ♀ similar to male, slightly lighter in colour with more obvious mesonotal patterning.

Apart from the type from the Congo I have only seen the following.

SIERRA LEONE: Batkanu, 1 ♂, 2 ♀, 28.viii.1911 (*H. E. Arbuckle*).

The *NIDOR*-species group

Small species with dark, narrow, and normally strongly receding ventral facial region. Eyes large in comparison with head size. Male fore femoral armature reduced or absent.

*Paralimna (Paralimna) nidor* Cresson

(Text-fig. 62)

*Paralimna nidor* Cresson, 1933 : 31.*Paralimna nidor* Cresson; Cresson, 1947 : 110.*Paralimna nidor* Cresson; Wirth, 1955 : 54.*Paralimna nidor* Cresson; Soika, 1956a : 493.

An interesting species very closely related to *Paralimna sponsa* Soika, and, from the region of the Congo, very difficult to differentiate in the female sex. Differs from *Paralimna sponsa* in facial colour, and lack of fore femoral armature of the male. In his description, Cresson expressed some doubt as to the validity of this species, but in later work refers to it as a distinct species. The series from Ngong in Kenya recorded by Cresson (1947 : 110) is in fact a distinct species, being larger

and darker with a comb of setae on the male fore femora. This species is described in this work as *Paralimna dorina* sp. n.

♂. *Head*: predominantly dark brown but due to the extensive grey dusting of the ventral region of the face in Congolese specimens, this species is keyed twice in separate parts of the key to species. Face slightly paler, with a median, and often two lateral, darker lines. Facial series of two to three long weak bristles, widely separated at their insertion, and numerous short hairs. Anterior fronto-orbital lateral to, or only slightly anterior to the frontal bristle (cf. *sponsa*). Buccae dark brown with strong bristles in irregular rows.

*Thorax*: dark brown, with three interrupted yellowish brown vittae on the mesothorax between the dorsocentrals and varying amounts of grey dusting laterally. Pleura dark brown.

*Legs* totally brown, fore and hind tarsi may have a short golden yellow ventral brush.

*Wings*: membrane uniformly infumated.

*Abdomen*: with narrow grey fasciae, almost complete on segment two, but on other segments interrupted by a broad continuous brown median vitta.

♀ very similar to ♂ in body form and colouring.

♂ *genitalia* almost identical with those of *Paralimna sponsa* (Text-fig. 62).

Material studied. CONGO: Rutshuru, 36 ♂, 15.v.36 (*L. Lippens*); Urundi Bururl, 1 ♂, 1949 (*F. François*); Ruanda, Cite de Nkuli, 5 ♂, 17.iii.36 (*L. Lippens*); Rutshuru, 9 ♂, 7.v.37 Mission Prophylactique; Kamogobe (Sud Masisi), 15 ♂, 4.iii.36 (*L. Lippens*); Uéle, Gangala na Bodio, 5 ♂, 15.iv.36 (*L. Lippens*); E. Rutshuru, Kibirizi (frontière), 1 ♂, 6.ii.36 (*L. Lippens*); Elizabethville, 1 ♂, ii.1950 (*C. Seydel*) à la lumière; Rives Busira, 1 ♂, vi.36 (*J. Ghesquière*) (I.R.S.N.); Rutshuru, 1 ♂, 8.i.37 (*J. Ghesquière*) sur pierres (I.R.S.N.). UGANDA: Ruwenzori Range, Namwamba Valley, 10,000 ft., 1 ♀, xii.1934-i.1935 (*T. E. Jackson*); Ruwenzori Range, Kilembe, 4,500 ft. 3 ♂, 14 ♀, xii.1934-i.1935 (*F. W. Edwards*); Kyarumba, 4,500 ft. 3 ♀, xii.1934-i.1935 (*D. R. Buxton*); Budongo Forest, 1 ♀, 7.ii.1935 (*F. W. Edwards*).

### *Paralimna (Paralimna) sponsa* Soika

(Text-fig. 61)

*Paralimna sponsa* Soika, 1956a : 492.

A common species from Central Africa, very difficult to distinguish from *Paralimna nidor* Cresson in the female sex. The characteristic male fore femoral armature of a small number, eight to ten, flattened bristles, inserted over the apical third will separate this species from all others. In the typical form, the face is pale grey and the ventral region strongly receding.

♂ similar in colour to *Paralimna nidor*, differs as follows.

*Head*: face silver-grey, with one strong upper facial and one to two strong lower facial bristles. Dorsal facial region and buccae brown, latter with numerous short bristles. Buccae narrow. Frons with a labyrinthine pattern in brown and dusted yellow-brown. Anterior fronto-orbital bristle in advance of frontal.

*Thorax*: three narrow brown vittae on middle third of mesonotum, a broader more irregular brown band between the median vittae and lateral edge of mesonotum. Humeral region dusted grey. Majority of pleura dark brown.

*Legs* totally dark, tarsi slightly paler. Fore femora of male with eight to ten flattened bristles inserted over apical third. Scutellum brown with silver edges.

*Wings*: veins dark and membrane uniformly infumated, hind cross vein darkened along its length. Halteres reddish yellow.

*Abdomen*: dark brown, with grey fasciae, almost complete on segment two only.

Genitalia (Text-fig. 61) very similar in form to *Paralimna nidor*.

♀ differs only in colour of face, but area of brown variable.

Material studied. ANGOLA: Dundo, 1 ♂, ii. 1960 (*B. Machado*). UGANDA: N. Mt. Elgon, 6,250–6,500 ft., 1 ♀, 18.x.64 (*R. W. Crosskey*); Mafuga forests, Kigezi, 1 ♀, vi. 57 (*Van Someren*); Kigezi, Mafuga Forest, 7.vi.1957 (*V. G. L. Van Someren*).

CONGO: 39 km. S. of Malikale, 700 m., 14 ♂, 14 ♀, 25.xii.57 (*E. S. Rosst*). N.Y.; Elizabethville, Conpono, 1 ♂, ix. 1931 (*Alice Mackie*) (N.Y.); Costermansville, 6 ♂, v. 38 (*J. Ghesquière*) (I.R.S.N.); Rives Busira, 1 ♂, vi. 1936 (*J. Ghesquière*) (I.R.S.N.); Rutshuru, 1 ♂, i. 37 (*J. Ghesquière*) (I.R.S.N.); cav. Rutshuru, plaine de lave anciennement boisee, 1 ♂, xi. 1937 (*J. Ghesquière*) (I.R.S.N.); Sake-Kivu, 1 ♂, 27.i.37 (*J. Ghesquière*) (I.R.S.N.); Terr. Masisi, Kishengo, 1 ♂, 25.viii.37 (*J. Ghesquière*) (I.R.S.N.); Rutshuru, 48 ♂, v. 35–iv. 36 (*L. Lippens*); Ruanda, Gite de Nkuli, 8 ♂, 17.iii.36 (*L. Lippens*); Terr. Rutshuru, 11 ♂, vii. 37 (Mission Prophylactique); N. Lac Kivu, Rwankwi, 1 ♂, v. 48 (*J. V. Leroy*); Ruanda, Kisenyi, 1 ♂, 21.v.57 (*F. François*); Kamogobes (Sud Masisi) 10 ♂, 4.iii.36 (*L. Lippens*); Ruanda, Gite de Nkuli, 5 ♂, 18.iii.36 (*L. Lippens*); Ruanda, Urundi, Bururi, 2 ♂, x. 48 (*F. François*); Uele, Bayenga, terr. Wamba, 810 m., 1 ♂, 25.xi.56 (*R. Castelain*).

The Angolan specimen is appreciably lighter in mesonotal colour and patterning.

### *Paralimna (Paralimna) ustulata* Wirth

(Text-fig. 60)

*Paralimna ustulata* Wirth, 1956 : 385.

A small species, related to *Paralimna nidor* Cresson but appreciably darker in colour, and the males possessing a fore femoral comb of setae. The wing veins of most specimens are very strongly infumated. To Wirth's description may be added the following brief diagnosis:

Antennae black-brown. Arista with nine to ten lateral hairs. Head and thorax almost totally chocolate-brown, anterior edge of frons in some male specimens and mesonotum and scutellum laterally grey.

*Legs* dark brown, fore femora of male with seven, well spaced flattened setae on antero-ventral face.

*Wings* with hyaline membrane and dark veins, the membrane infumated widely along their lengths.

*Abdomen*: normal fasciated pattern, with complete grey fascia on segment two only, last two segments strongly darkened in male. Female with generally less of brown fascia but complete median vitta.

Male genitalia (Text-fig. 60).

Apart from the type material, the only other typical specimens I have seen of this species are as follows:

Material studied. S. AFRICA: Natal, Nr. Milani in Ahrens District, 1 ♂, 2 ♀, iv. 62 (*B. & P. Stuckenberg*).

The following specimens resemble the typical form in wing pattern and male genitalia but differ in density of body colour.

S. AFRICA: Natal, Drakensberg, Van Reenan, 3 ♀, xi.1926 (*R. E. Turner*); Natal, Karkloof Range, nr. Mt. Alida, Geekies Farm, 1,500 ft., 1 ♂, 1 ♀, 4.i.62 (*B. & P. Stuckenberg*); Natal, Gilitts, Pinetown District, 1 ♀, 11.i.62 (*B. & P. Stuckenberg*).

### The *ARABICA*-species group

Predominantly large species, with long vertical faces and horizontal vertex and frons. The antennae are usually inserted in line with the dorsal region of the eye.

#### *Paralimna (Paralimna) arabica arabica* Becker

(Text-fig. 78)

*Paralimna arabica* Becker, 1910 : 154.

*Paralimna arabica* Becker; Cresson 1929 : 186.

*Paralimna arabica* Becker; Soika, 1956a: 490.

I agree with Soika (1956a:490) in considering *Paralimna nubifer* Cresson, as only a southern subspecies of *Paralimna arabica* Becker.

A cinereous species with high face, characterized as follows:

*Head*: antennal segments I and II dark with dense grey dusting, III pale, also with grey dusting and pale pubescence. Arista pale brown with eleven to twelve lateral hairs. Face with distinct carinal protuberance. Ventral face greyish white, dorsal face grey with some dark dusting. Facial series of one strong bristle inserted high on face. Two to three stronger but short bristles more ventrally inserted on series, not porrect, plus numerous short decumbent setulae. Buccae totally grey, buccal bristle strong, numerous short bristles. Parafacialia silvered. Frons and vertex patterned with light brown on grey, central grey area around ocelli and ocellar bristles. Brown anterior frons setulose. Posterior fronto-orbital weak and short.

*Thorax*: mesonotum greyish buff-brown with darker brown indistinct vittae and irrorations. Disc of scutellum similarly marked, laterally silver grey. Pleura totally pale grey, very faint brown area in some specimens, in centre of the mesopleural sclerite.

*Legs*: all tarsi pale, rest of legs with heavy dark grey dusting. Male fore femoral armature consisting of eight to ten flattened bristles, widely separated and inserted over the majority of the anteroventral face. Strong yellow flexor pile on hind tarsi.

*Wings*, membrane hyaline or with slight infumation, small diffuse darker brown area at apex of second vein extending vertically over marginal and submarginal cells. Halteres pale yellow.

*Abdomen*: with normal but less discrete fasciated grey and dark brown pattern. In some specimens brown reduced in area.

Male genitalia (Text-fig. 78).

Size range considerable, 4-6.5 mm. body length.

Material studied. W. ADEN PROT.: Wadi Dareiza, S.W. of Dhala, c. 4,500 ft., 10 ♂, 28 ♀, 6-9.xi.1937. Jebel Jihaf, Wadi Leje, c. 6,800 ft., 1 ♀, 13-15.x.37. Wadi Tiban, N.W. of Jebel Jihaf, c. 3,800 ft., 2 ♀, 21.x.37. YEMEN: Wadi Jaira, trib. of Wadi Sihan, c. 3,000 ft., 6 ♂, 8 ♀, 10.iii.38 (*H. Scott & E. B. Britton*); Usaifira, 1 mile N. of Ta'izz, c. 4,500 ft., 1 ♀, 13.xii.37 (*H. Scott & E. B. Britton*).

*Paralimna (Paralimna) arabica nubifer* Cresson

May be distinguished from the nominate subspecies by the following characters:

Generally larger size, darker colouring, dorsal face and frons darker brown, brown on the mesopleurae and mesonotum and area of brown abdominal fasciae greater. Wings with or without the diffuse infumated areas, but infumation not restricted to veins and their apices. In the very large series in the B.M.(N.H.) males are relatively scarce.

Material studied. Numerous examples including the following:

SIERRA LEONE: Magberta, 6 ex., 8.ix.24; Senahu, 3 ex., 13.x.12 (*J. S. Simpson*); 6 ex., Roboro, 18.ix.24 (*E. Hargreaves*). NIGERIA: Ibadan, 7 ex., 21.viii.13 (*W. A. Lamborn*); Zungeru, 5 ex., 15.xi.1910 (*J. S. Macfie*); Lagos, 1 ex., i.1959 (*C. H. Andrewes*); Shika Ponds, Zaria, 3 ex., 29.vi.66 (*J. M. Lyall*); Bude Dobe, 1 ex., 28.v.12 (*J. W. S. Macfie*); Ilorin, 4 ex., iv.1912 (*J. W. S. Macfie*); Oshogbo, 3 ex., (*T. F. G. Mayer*); Offa, 2 ex., 25.iii.12 (*J. W. S. Macfie*); Kateri, 1 ex., 2.xiii.10 (*J. J. Simpson*). GHANA: Tomali, 75 ex., xi.1916 (*J. J. Simpson*); Accra, 31 ex., 1922 (*J. J. Simpson*); Nr. Accra, Taiman, 33 ex., ix.1922 (*J. W. S. Macfie*); Aburi, 2 ex., 1912-13 (*W. H. Patterson*); Obuasi, 2 ex., 17.vii.06 (*W. M. Graham*); Kororidua, 1 ex., 5.viii.19 (*F. H. Storey*); Insuta, 3 ex., 9.ix.28. LIBERIA: Gbanga, 1 ex., ix.26 (det. as *P. dasycera* *Bezzi*) N.Y. CONGO: Katanga, Lufira River, 3,500 ft., 19.ix.07 (*Neave*); Parc Nat. Albert, 7 ex., 20.ix.37 (*J. Ghesquière*); Marais Kalulu, 1 ex., 3.v.39 (*H. J. Bredo*) (I.R.S.H.); Mwashia, 1 km. de la salire, 2 ex., 3.v.1939 (*H. J. Bredo*) (I.R.S.H.); Terr. Rutshuru, 30.viii.37, 6 ex., Mission Prophylactique; Nyangwe, 14 ex., iv-v.1918 (*R. Mayne*); Kasongo, 1 ex., viii.59 (*P. L. G. Benoit*); Rutshuru, 4 ex., 17.v.36 (*L. Lippens*); E. Rutshuru, Kibirizi, Frontière, 2 ex., 6.ii.36 (*L. Lippens*); Yangambe, (Stan.) 1 ex., xi.57 (*P. Dessart*); Elizabethville, 1 ex., ii.50 (*C. L. Seydd*); Uele, Gangala na Bodio, 2 ex., 15.v.36 (*L. Lippens*); Kwango, Kinlati-Yasa, 1 ex., 15.ii.52 (*R. P. J. Ruelle*); N. Kawirondo, Yala Bridge, 1 ex., 24.viii.1911 (*W. Woodhouse*). KENYA: Nairobi, 2 ex., vii.30 (*Van Someren*); Tavete For., 1 ex., viii.47 (*Van Someren*); Teita Hills, 1 ex., viii.47 (*Van Someren*); Mombasa, 1 ex., xi.27 (*Symes and Hopkins*). MALAWI: Mainvale, 2 ex., 6.iv.1932 (*W. A. Lamborn*); Blantyre, 7 ex., 1910 (*J. E. S. Old*). UGANDA: E. Busia, 4 ex., 1913 (*F. Spirè*); L. George, 1 ex., 1931 (*E. B. Worthington*); Buamba Forest, Semliki Valley, 2 ex., 2,300-2,800 ft. (*D. Bruce*); Ruwenzori Range, Fort Portal, 2 ex., 4.xii.1934 (*F. W. Edwards*). ZAMBIA: Chilanga, 1 ex., 2.ix.13 (*R. C. Wood*). TANZANIA: Ufiomi, 1 ex., 3.vi.1916 (*W. A. Lamborn*); Zanzibar, 1 ex., i-ii.1925 (*H. J. Snell*); Songea, 3,800 ft., 1 ex., 23.iii.33 (*R. F. Johnstone*); Mpwapwa, 12 ex., vii.45 (*P. A. Buxton*).

*Paralimna (Paralimna) arabica ugandensis* ssp. n.

(Text-fig. 79)

A subspecies of distinctive rank, being easily distinguishable from *arabica* and *nubifer* by the pale golden brown facial colour and the strongly marked wings.

Differs from the described subspecies of *Paralimna arabica* in the following manner:

Arista with fourteen to fifteen lateral hairs, lower face pale golden brown rather than grey. Anterior part of bucca, majority of mesopleuron and mesonotum dark golden or matt brown.

Fore femora of male with ten flattened bristles in the anteroventral series but inserted over a shorter length than in either of the other subspecies. Wing membrane hyaline, dark brown veins, apices of first, second, third and fourth veins infumated along their lengths, broadly so around second veins, darkening the apex of the marginal cell.

♂ genitalia differs from *Paralimna a. arabica* and *Paralimna a. nubifer* in the form of the external claspers (Text-fig. 79).

Material studied. Holotype ♂. UGANDA: Ruwenzori Range, Kyarumba, 4,500 ft., xii.1934-i.1935 (*D. R. Buxton*). B.M. (N.H.).

Paratypes. UGANDA: Kisubi, 1 ♂, 1 ♀, 26.vii.38 (*B. Philip*), nr. Fountain in forest; Kampala, 1 ♂, 7.ix.18; Ruwenzori Range, Kilembe, 4,500 ft., 1 ♂, 4 ♀, (*F. W. Edwards*); as type, 2 ♂, 2 ♀; Katosi, 2 ♂, 3 ♀, 20.ix.36 (*E. G. Gibbins*), on debris at edge of lake; Segibwa Falls, 1 ♂, 3 ♀, 28.iii.1935 (*E. G. Gibbins*), attracted to human faeces; Ruwenzori Range, Fort Portal, 1 ♀, 4.xii.1934 (*F. W. Edwards*) xii.1934-i.1935; 1 ♀, (*D. Bruce*) 1903; Ruwenzori Range, Mpanga valley, 6,000 ft., 1 ♀, xii.1934-i.1935 (*F. W. Edwards*). CONGO: Mambassa, 1 ♂, 8.ii.52 (*J. Wolfs*).

One specimen also from the Congo, I have not included as a paratype as it possesses a grey face.

Kasongo, 1 ♀, viii.59 (*P. L. G. Benoit*).

### *Paralimna (Paralimna) monstrosa* Soika

(Text-fig. 76)

*Paralimna monstrosa* Soika, 1956a : 491.

Related most closely to *Paralimna lynx* Cresson, but unlikely to be confused, having a very high and prominent face, usually creamy or slightly silvery white, and very weak facial bristles, not the long porrect bristles of *Paralimna lynx* Cresson.

*Head*: with very long straight face, pure silver-white with yellow infuscation at the inter-antennal hump. One single very weak bristle in facial series plus a long line of tiny erect hairs, bristle occurring mid-orbitally. Epistoma very receding, silver-grey, palpi silver-white with a series of short bristles. Para-orbital region silver-grey laterally. Buccae dark brown with strong overall setulation and two very long and strong curved bristles, the dorsal of which extends beyond the face when viewed in profile. Antennae very distinctive, segment III with a broad white area basally, tip orange-brown. Arista with eleven lateral hairs. Frons with labyrinthine pattern arranged around ocellar prominence.

*Thorax*: diffuse pattern on lateral regions, two broad, poorly defined bands in centre. Scutellum brown and golden brown, dusted with silver-grey areas between the lateral scutellar bristles. Humeral areas of thorax grey, as also mesonotal and pleural suture. Metanotal areas completely grey. Mesopleural, sternopleural and anterior part of pteropleural sclerites dark brown.

Trochanters, tibiae, especially the fore, and tarsi all pale. Fore femora pale apically and basally. Posteroventral setae on fore femora not modified.

*Wings* infumated, hind cross vein darkened. Halteres pure white at tip, yellow at base.

*Abdomen*: abdominal setae on tergites short and weak with a few long and stronger setae laterally, and along the posterior regions of the tergites. Segment one with two grey dusty patches. Segment two with a narrow brown stripe, the grey band complete medially. Segment three brown and grey bands of same width, grey band interrupted by wedge of brown. Segment four, grey band slightly wider than brown, with broader brown wedge.

Male genitalia (Text-fig. 76).



♀. Differs most noticeably in colour of face, which is more grey and more vertical without the flattening and lateral ventral expansion.

Material studied. ANGOLA: Museu do Dundo, 3 ♂, 2 ♀, N.M. TANZANIA: Nyika, Kilossa, 1 ♂, 1935, (*G. Werner*), I.R.S.N; Luanda, Dundo, 1 ♂, 4 ♀, 21.ix.49 (*B. Malkin*).

*Paralimna (Paralimna) lynx* Cresson

(Text-fig. 80)

*Paralimna lynx* Cresson, 1933 : 30.

*Paralimna lynx* Cresson; Cresson, 1947 : III.

*Paralimna lynx* Cresson; Soika, 1956a : 492.

This species has a high face similar to *Paralimna monstrosa* Soika, but differs most noticeably in having a darker face, longer facial bristles and a single long buccal bristle.

♂ and ♀. *Head*: antennal segments I and II dark, III covered in a pale pile of long hairs. Arista with thirteen lateral hairs. Face with grey lower dusting, changing to brown on carinal protuberance. Two or three long, weak, curved facials, touching in mid-line, and extending beyond anterior line of face when viewed laterally. Buccae brown, strongly bristled, the strong anterior bristle almost reaching facial margin. The anterior fronto-orbital bristle strong.

*Thorax*: metapleuron and metanotum grey, remainder of thorax dark brown with small scattered patches of grey on the mesonotum. Scutellum with dark brown areas around basal setae, and apical quarter of scutellum, dorsally and laterally, elsewhere grey dusted.

*Legs*: femora and tibiae dark, tarsi pale with some grey dusting and yellow hairs. Male fore femora armature not developed.

*Wing* membrane totally infumated, veins pale brown.

*Abdomen*: grey fasciae narrow, less than half of each segment, and totally delimited in female and delimited on all but segment three in male.

♂ genitalia (Text-fig. 80).

Apart from the type series I have seen only one other specimen from Nigeria which I would place in this species.

Material studied. NIGERIA: Lagos, Ajoute, 1 ♂, 24.i.59 (*C. H. Andrewes*).

However, the following specimens are doubtfully placed here.

GHANA: Aburi, 1,400 ft., 1 ♀, xii.1941 (*K. M. Guichard*). LIBERIA: Cape Mount Co. Dia.

*Paralimna (Paralimna) nebulosa* Wirth

(Text-figs. 48, 77)

*Paralimna nebulosa* Wirth, 1955 : 53.

Very closely related to *Paralimna lynx* Cresson, but with consistent differences sufficient to warrant separate status. As Wirth states in his discussion of this species, *Paralimna lynx* Cresson has the pleura entirely brown, only partially so in *Paralimna nebulosa* Wirth, facials longer, almost meeting in the mid-line, the cheeks only a fourth as broad as height of head and the wings uniformly tinged with

brown. In this species all the veins are heavily infumated along their lengths. The carinal protuberance in this species is far larger than that of *Paralimna lynx* Cresson.

Easily distinguished by high, dark grey face, long facial and buccal bristles, dark buccae and pleura, with grey dorsal one third of mesopleuron and lateral edge of mesonotum. Wing veins strongly marked in Kenyan specimens, less strongly so in Ugandan, a darker brown cloud over apex of marginal and submarginal cells. Male genitalia (Text-figs. 48, 77). Full description by Wirth.

Material Studied. UGANDA: Bwamba Pass (West Side), Ruwenzori Range, 5,500–7,500 ft., 3 ♀, xii.1934–i.1935 (*F. W. Edwards*). KENYA: Teita Hills (S), 20 ♀, viii.47. (*Van Someren*).

***Paralimna (Paralimna) pokuma* Cresson sp. rev.**

(Text-figs. 47, 75)

*Paralimna pokuma* Cresson, 1933 : 32.

*Paralimna pokuma* Cresson; Cresson, 1947 : 110.

*Paralimna pokuma* Cresson; Soika, 1956a : 493.

Both Cresson, 1947, and Soika, 1956, have synonymized this species with *Paralimna nidor* Cresson, on the size and colour of the female type specimen, Cresson calling it 'a large, long faced *Paralimna nidor*'. In the British Museum, (Natural History) I have found a further three specimens, two females, and one male, and the fore femora of the latter specimen has a well developed series of long, weak, flattened bristles, thus showing it to be a distinct species.

A very large species which, with its heavily infumated wings, dark brown buccae and pleura, and male fore femoral comb, should not be easily confused. I consider it to be more closely related to the *Paralimna arabica* species group.

♂. *Head*: antennal segments I and II dark, segment III elongate, with dense short brown pubescence and long sparse white pubescence. Arista with fourteen lateral hairs. Face with dark golden brown dusting. Some grey dusting on parafacials and below facial series. Two to three strong bristles and numerous fine hairs make up the broad facial series. One long and three short porrect buccal bristles plus numerous short setulae. Buccae brown. Frons lighter than face, more golden yellow to brown, areas around bristles darker brown.

*Thorax*: mesonotum pale brown, almost totally obscured by darker brown vittae and scattered brown areas; lateral areas, humeral callosities and dorsal third of mesopleuron grey to grey-brown. Metapleuron grey, rest of pleura, excepting the dorsal half of mesopleuron dark brown.

All tarsi pale, rest of legs blackish brown with a light grey dusting. Twelve to thirteen weak, relatively long, slightly flattened bristles in anteroventral series on fore femora, apical one-sixth free from bristles.

*Wing* membrane pale brown, veins dark brown.

*Abdomen*: well developed grey and brown fasciated pattern, grey fasciae interrupted broadly by median brown vittae on last three visible segments.

♂ genitalia (Text-figs. 47, 75).

Length, male, 6.5 mm.

Material. GHANA: Ashanti, Obuasi, 2 ♀, 1 ♂, 7.viii.1907 (*W. M. Graham*), caught on mud in bush.

*Paralimna (Paralimna) lamborni* Cresson*Paralimna lamborni* Cresson, 1947 : 111.

Described from a single female specimen and not subsequently recognized. Most closely related to *Paralimna nebulosa* Wirth but differs in its large size, uniformly darkened wings and paler fore tibiae.

Holotype ♀.

*Head*: antennae lacking, face with very prominent carina, facial bristles weak, set high on face, the most dorsal bristle stronger than the rest. Face brown except at lower angles, and between antennae, pale yellow to silver. Buccal bristle long, buccae dark brown. Frons dark brown with golden yellow patterning.

*Thorax*: most of pleura and mesonotum dark brown, a broad grey band along edge of mesonotum and mesopleuron, across base of wing and 'joining' silver-grey lateral areas of abdominal grey fasciae.

All tarsi pale, fore tibiae paler than femur, rest of legs blackish brown.

*Wings* uniformly but palely infumated.

*Abdomen*: except on segment two, grey fasciae very reduced, only narrow strips. Laterally they expand to full width of segment and take a silver sheen.

Length, 6 mm.

Material studied, only the type specimen. TANZANIA: Moshi, 1 ♀, 3.v.1916 (*W. G. Lamborn*).

The *CONFLUENS*-species group

Strongly marked and usually with maculated wings. The median anterior frontal region is raised from the surrounding frons. The lateral anterior frontal angles are velvety black with or without a white pupil.

*Paralimna (Paralimna) confluens* Loew

(Pl. 1, figs. 3, 4, Text-figs. 57, 67)

*Paralimna confluens* Loew, 1862 : 13.*Paralimna ornatipennis* Adams; Cresson, 1929 : 193.*Paralimna confluens* Loew; Cresson, 1947 : 113.*Paralimna confluens* Loew; Soika, 1956a : 495.

A common species, showing considerable variation in wing pattern. Most closely related to *Paralimna vansomereni* Cresson, and *Paralimna cressoni* sp. n., from which it is easily distinguished by means of the sub-marginal cell patterning of the wing (Pl. 1, figs. 3, 4).

*Head*: antennae black, segment III with pale pubescence. Arista with eleven lateral hairs. Face, epistoma and buccae silver-grey with golden overtones when viewed at an angle. One long weak bristle, one shorter bristle and a series of weak hairs in facial series. Facial carina well developed and with a longitudinal white bar between antennae. Frons with a pair of black, white pupilled spots on the anterior fronto-orbital angles, at the base of the antennae, median of which is a silvered area.

*Thorax*: grey, on the mesonotum three dark brown vittae and considerable brown marking laterally. Brown patches on the meso-, ptero- and sternopleura. Scutellum brown dorsally, laterally grey, except for brown apex.

*Legs*, dark blackish brown, tarsi more pale.

*Wing* variation considerable (Pl. 1, figs. 3, 4).

*Abdomen*: greyish green fasciae small, wedgelike and never extending for more than one-third the width of the segments.

Male genitalia (Text-figs. 57, 67).

The West African form is very much darker, blackish brown not russet, with pale fasciae on abdomen even further reduced. The facial series are reduced to a few hairs.

Material studied. CAMEROON: Tiko, 1 ♀, 1-5.ix.1935 (*F. Zumpt*), N.Y. CONGO: Elizabethville, 1 ♂, 8.iv.39 (*H. V. Bredo*) B.M.(N.H.); Rutshuru environs, 1 ♀, 3.xi.1937 (*J. Ghesquière*); Eala, 2 ♀, viii.1935 (*J. Ghesquière*); Rutshuru environs, 3 ♂, 3.xii.1937 (*J. Ghesquière*); Rutshuru, 1 ♂, 1 ♀, 7.v.37 Mission Prophylactique; Terr. de Kasongo, Riv. Lumami, 1 ♂, x-xii.1959 (*P. G. L. Benoit*); Kamogobe, (Sud Masisi), 1 ♂, 4.iii.36 (*L. Lippens*); Kwango, Kiniati-Yasa, 1 ♂, 15.ii.52 (*R. P. J. Ruelle*); Kasongo, 1 ♂, 1 ♀, viii.59 (*P. G. L. Benoit*); N. Lac Kivu, Rwanki, 2 ♂, 15.ii.52 (*J. V. Leroy*); Rutshuru, Fuku, 1 ♂, 1 ♀, 30.v.36 (*L. Lippens*); Terr. de Kasongo, grotte de Mwana-kusu, 1 ♀, 23-28.viii.57 (*P. G. L. Benoit*).

### *Paralimna (Paralimna) mackieae* Cresson sp. rev.

(Pl. 1, fig. 8, Text-figs. 56, 68)

*Paralimna mackieae* Cresson, 1947 : 114.

*Paralimna vansomereni* Cresson; Soika, 1956a : 496.

Most easily distinguished from *Paralimna cressoni* sp. n. and *Paralimna vansomereni* Cresson, by presence of white areas on marginal and submarginal cells, sinuate hind supernumery cross vein half way between the other two, and smaller eyes.

Differs from the two closely related above mentioned species in the following way:

Variable amounts of dusting on anterior edge of frons but shiny black edge usually broad. Buccae almost as wide as vertical height of eyes. Brown undulating band between dorsal and ventral halves of face more distinct. Two to three stronger facials plus five to six short, weak, hairs. Variable amounts of brown on the buccae. Pleura predominantly grey, some brown on mesopleuron and sternopleuron. Fore coxae grey dusted, fore femoral comb of male, of shorter slightly flattened setae, widely spaced along complete apical three quarters of the anteroventral face. Wing pattern distinctive, membrane pale brown, darker over and around cross veins of which there are three, one intermediate between the anterior and posterior cross veins in the first posterior cell. There are two white areas in the marginal cell, and along the costal edge of the submarginal cell is broadly white (Pl. 1, fig. 8). Abdominal segment one brown, narrow grey fasciae on segments two to five, the grey being yellowish on the last two segments. Male genitalia (Text-figs. 56, 68).

Soika synonymized this species with *Paralimna vansomereni*, comparing the type of the latter with Cresson's description of the former, which tally on many points, but comparison of the types and much extra material convinces me that they are distinct species.

Known with certainty only from South Africa.

Material studied. The type and 1 paratype are now in the B.M.(N.H.), the other paratype is deposited in Philadelphia; all are in very poor condition.

SOUTH AFRICA: Port St. Johns, Pondoland, 2 ♀, 5-30.iv.1923 (*R. E. Turner*); Cape Province, George, 1 ♂, 2 ♀, 15-17.xi.1921 (*R. E. Turner*); Natal, Drakensberg, Forestry Reserve, Cathedral Peak, Little Berg Summits, Themeda grassland, 2 ♀ iii.1959 (*B. R. and P. J. Stuckenberg*); Port St. Johns, 4 ♂, 1 ♀, 20-25.xi.1961 (*B. and P. Stuckenberg*); E. Cape, Storms River Pass, Tsitsikana Range, indigenous forest, 3 ♂, 1 ♀, 12-13.x.1959 (*B. and P. Stuckenberg*); Cape Peninsula, Whitsand dunes, 1 ♂, 25-26.vii.1959 (*B. and P. Stuckenberg*); E. Cape Province, Karreedouw Mountains, W. of Humansdorp, 1 ♀, 14.x.1959 (*B. and P. Stuckenberg*).

The following two specimens from the Congo probably represent a new subspecies. The wing has the marginal cells without pattern and lacks the adventitious cross vein. As both specimens are in very poor condition I refrain from describing this subspecies as new until further material be obtained. They would key out to *Paralimna vansomereni* in the key to species.

CONGO: Rutshuru, 1 ♂, 1 ♀, 6.xii.1937 (*J. Ghesquière*), I.R.S.N.

### *Paralimna (Paralimna) vansomereni* Cresson

(Pl. 1, fig. 6, Text-figs. 55, 66)

*Paralimna vansomereni* Cresson, 1933 : 25.

*Paralimna vansomereni* Cresson; Cresson, 1947 : 114.

*Paralimna vansomereni* Cresson; Soika, 1956a : 496.

May be distinguished from *Paralimna cressoni* sp. n. and *Paralimna mackieae* Cresson, by means of the wing pattern, pale but not intense white areas, neither dark nor pale areas extend on to marginal or submarginal cells except where darkened adventitious veins arise, and abdominal pattern where the grey fasciae are greatly reduced. A Central and East African species recorded from the Congo, Uganda and Kenya and Tanganyika. The type appears to be teneral.

The following brief description is intended to accentuate the points of comparison of this with related species.

Frons without the black dusted circular area anterior to the ocellar triangle. Facial and buccal bristles weak, proclinate, antero-fronto-orbitals weak.

Fore femoral male comb, consisting of weak, only partially flattened, setae over the majority of the anteroventral face.

Mesonotum less strongly darkened with brown. Considerable areas of brown on pleura.

Wing membrane pale brown with darkening over the cross veins, the middle cross vein as represented in *Paralimna mackieae* Cresson, is here a short vertical extension from the fourth longitudinal vein. Around the darkened veins are small areas of white, but not the solid intense white of *Paralimna mackieae* Cresson. (Pl. 1, fig. 6).

Abdomen dark brown with narrow incomplete grey-green fasciae on the posterior edges of the segments. Male genitalia, Text-figures 55, 66.

Material studied. The Tanzanian specimen is of particular interest, being the most southerly recorded specimen of this species, showing increased contrast between

the light and dark areas of the wings, but no extension of the pattern on to the marginal and submarginal cells.

KENYA: Teita Hills, 8 ex., viii.47 (*Van Someren*). CONGO: Urundi, Bururi, 2 ♂, 1 ♀, x.1948 (*F. Francois*); Urundi, Bururi, 3 ♀, 1949 (*F. Francois*). UGANDA: Ruwenzori Range, Namwamba valley, 6,500 ft., xii.1934-i.1935 (*F. W. Edwards*); Ruwenzori Range, 6,000 ft., 1 ex., vii.45 (*Van Someren*). TANZANIA: Njombe, 6,000-6,500 ft., 1 ♂, 16.x.57 (*W.P.*).

### *Paralimna (Paralimna) cressoni* sp. n.

(Pl. 1, figs. 5, 6, 8, Text-fig. 70)

Closely related to the mainland species of *Paralimna vansomereni* Cresson and *Paralimna mackieae* Cresson, but specifically distinct from both (Pl. 1, figs. 5, 6, 8).

Eyes larger and more bulbous than either of the mainland species, fore femoral anteroventral bristle series of male slightly longer than that of *Paralimna mackieae* and facial series of bristles considerably weaker than *Paralimna mackieae*.

♂. *Head*: antennae totally black, segment III with long pale pubescence. Arista with ten lateral hairs. Ventral half of face, below facials, grey, central carina with white dorsal patch upper half yellow with large brown patches. Buccae silver-grey. One or two strong facials, dorsal two thirds stronger than lower, plus seven to eight short weak hairs. Two buccal bristles, lower two thirds length and strength of dorsal, eight to ten short aggregated bristles. Frons fronto-orbital angles velvet-black with white pupil, black delimited both anteriorly and posteriorly by golden yellow. Anterior frontal edge only narrowly shiny black. Posterior orbital bristle considerably weaker and shorter than anterior bristle.

*Thorax*: golden yellow ground colour almost obliterated by the brown of vittae and irrorations. Pleura brown with a grey irregular band from the propleuron to the metapleuron passing through the middle of the mesopleuron.

*Legs*: tarsi pale, rest of legs dark. Fore femoral male comb, fourteen to sixteen short slightly flattened bristles over the central half of the femur. Anteroventral face of fore tibia strongly silver dusted.

*Wings*: membrane pale brown with darker vertical bars in first posterior cell separated by white areas. Subcostal, marginal and submarginal cells without white pattern nor, in most specimens, darker patches. In some, adventitious short veins are heavily pigmented. Dark patches in the first posterior cell may or may not be centred around adventitious veins. Discal and second posterior cells with irregular white patch, third posterior cell may have darkened centre. While the pattern of brown and white bars is irregular, they never extend on to the submarginal, cf. *Paralimna mackieae*.

*Abdomen*: segment one dark brown, segment two grey-green with narrow anterior brown fasciae just delimited by pale brown. Segments three and four with narrow grey fasciae, segment five with only lateral grey dusting.

Male external clasper (Text-fig. 70).

Holotype ♂. MADAGASCAR: D-S, Mtge. d'Ambre, 12.v.58 (*F. Keiser*).

Paratypes, data as type, 12 ♂, 13 ♀; locality as type, 8 ♂, 13 ♀, 26.v.58; locality as type, 2 ♂, 20 ♀, 21.v.58; Joffreville, 2 ♀, 25.v.58 (*F. Keiser*); Joffreville, 1 ♂, 9.v.58; Joffreville, 3 ♂, 5 ♀, 10.v.58; Joffreville, 1 ♂, 13.v.58; Tam, Perinet, 1 ♂, 2 ♀, 2.x.58 (*F. Keiser*); Tam, Perinet, 1 ♂, 6.x.58 (*F. Keiser*); Nord, Montagne

d'Ambre, 1,000 m., dct. Diégo Suarez, 5 ♂, 9 ♀, 23.xi-4.xii.58 (*B. Stuckenberg*); Mt. d'Ambre, 1 ♂, 1 ♀, xii.48 (*R.P.*), Inst. Scient. Mad.

Type to Basle, plus seventy paratypes; 7 ♂ and 8 ♀ to B.M.(N.H.).

***Paralimna (Paralimna) approximata* Cresson**

(Pl. 1, fig. 7, Text-figs. 53-65)

*Paralimna approximata* Cresson, 1947 : 115.

*Paralimna ? confluens* Loew; Soika, 1956b : 499.

A large distinctive species of the *Paralimna confluens* species group, easily distinguishable by means of size and large dark brown wings with numerous niveous patches. Recorded only from the Cameroons. Not a variety of *Paralimna confluens* as suspected by Soika (1956b : 499); the genitalia of the male are quite distinct (Text-figs. 53, 65).

♂. *Head*: face with a pronounced carina, only ventral edge of face grey, remainder of face pale yellow with dark brown mottling. One to two strong facials and five to six short weak hairs in facial series. Buccae brown, bristle large and strong, numerous setulae. Frontal niveous pupils equidistant between orbits. Anterior fronto-orbital bristle reduced to a weak setula only slightly longer than posterior fronto-orbital bristle. Brown area around vertical bristles extends on to occiput as two narrow vertical bands.

*Thorax*: mesonotum predominantly dark brown with scattered patches of yellowish brown. Two rows of acrostichals preceded by a pair of narrow yellowish vittae extending only as far as first dorsocentral. Scutellum brown. Pleura dark brown apart from an irregular grey band passing from propleuron to metapleuron along base of wing.

*Legs*: All tarsi pale, rest of legs dark blackish brown.

*Wings* large and rounded, strongly patterned (Pl. 1, fig. 7).

*Abdomen*: dark brown with narrow golden yellow to greenish yellow fasciae, latter complete on segments two and three only, final two segments appreciably darker.

Length 4.5-6 mm.

Material studied. Following specimens taken by sweeping, beating or at light:

CAMEROUN: Onyanga, 8,100 ft., 21.i.1932 (*M. Steele*); Musake, 6,350 ft., 8, 9, 13.i.1932 (*M. Steele*); Bamenda Hosp., 4,800 ft., 1 ex., 7.xii.1937 (*M. D. W. Jeffreys*); 'along Kumba Mumfe Road' 1 ex. (*A. Zahra*).

***Paralimna (Paralimna) pupulata* Cresson**

(Text-figs. 51, 63)

*Paralimna pupulata* Cresson, 1939 : 9.

*Paralimna pupulata* Cresson; Cresson, 1947 : 113.

*Paralimna pupulata* Cresson; Soika, 1956a : 497.

This species appears to be confined to a wide 'belt' east to west across tropical Africa with a distribution from N. Nigeria through the Congo to Kenya in the east.

An easily distinguished species, without wing pattern but having the typical head colouration and patterning of a member of the *Paralimna confluens* group. The body colouring is predominantly black with varying amounts, usually slight, of paler dusting on face and pleura. It could only be confused with *Paralimna basilewskyi* Soika, but is considerably larger, with more dusting and a fully formed fasciated abdominal pattern. The median mesofrons shining and not dull and crenulate as in *Paralimna basilewskyi* Soika.

*Head*: the frons dark with velvet-black areas extending from fronto-orbital angle to base of frontal bristles, delimited anteriorly and posteriorly with silvered areas and with a niveous spot on the anterior edge of frons close to base of antennae. The niveous spot equidistant from the orbits. Vertex with light, brown dusting. Fronto-orbitals weakly developed. Face lightly dusted with silver-white, buccae similar. On most specimens a rubbed shining area below eye. Facials, two strong and three to four weak, bristles. Buccal bristle weak and short, plus scattered setulae on buccae.

*Thorax*: dark black-brown with four interrupted grey vittae between the dorsocentrals; further supra-alar and presutural patches of grey. Pleura lightly grey dusted.

*Legs* dark with light grey dusting, tarsi pale, fore tarsi only slightly paler than tibiae. Weak male fore femoral comb. Scutellum grey at tip, dark velvet blackish brown at base.

*Wings* with veins and membrane pale yellowish brown.

*Abdomen*: narrow grey-green fasciae on posterior edge of abdominal segments interrupted medianly by the median brown vitta on all segments. Female, median brown abdominal vitta narrower than male.

Male genitalia (Text-figs. 51, 63).

Material studied. UGANDA: Ruwenzori Range, Kyarumba, 4,500 ft., 1 ♀, xii.1934-i.1935 (*D. R. Buxton*); Ruwenzori Range, Kilembe, 4,500 ft., 6 ♂, 3 ♀, xii.1934-i.1935 (*F. W. Edwards*); Mt. Elgon, between Butandiga and Bulambuli, 8,000 ft., 2 ♂, 4 ♀, 7.viii.1934 (*J. Ford*); Ruwenzori Range, Fort Portal, 2 ♀, 4.xii.1934 (*F. W. Edwards*); Budongo Forest, 1 ♂, 7.ii.1935 (*F. W. Edwards*); West Nile Distr., Paidha, 1 ♀, 20-24.x.64 (*R. W. Crosskey*). KENYA: Teita Hills (S), 1 ♀, viii.47 (*Van Someren*); Ngong, 1 ♀, vi.1936 (*Van Someren*); Trans-Nzoia Dist., Nr. Cherangari Hills, 40 m. E. of Mt. Elgon, 6,200 ft., 1 ♂, 1 ♀, 6-9.ii.1925 (*C. R. S. Pitman*). NIGERIA: Zungeru, 1 ♂, 1 ♀, 14-15.xi.1910 (*J. W. S. Macfie*); Kateri, 1 ♀, 2.xii.10 (*J. V. Simpson*). MADAGASCAR: Sambirano, Lokobe, Nossi-Bé, 6 m., 8 ♂, 6 ♀, 9-23.xi.57 (*B. Stuckenberg*). CONGO: Rutshuru, 2 ♂, 1 ♀, i.37 (*J. Ghesquière*), I.R.S.N.; Kamogobe (Sud Masisi), 2 ♂, 4 ♀, 4.iii.36 (*L. Lippens*); Terr. Rutshuru, 1 ♂, 1 ♀, 7.iv.37, Mission Prophylactique; Terr. Rutshuru, 1 ♀, 7.v.37, Mission Prophylactique; Terr. Rutshuru, 1 ♀, 30.vii.37, Mission Prophylactique; Terr. Rutshuru, 13.viii.37, Mission Prophylactique; N. Lac Kivu, Rwanki, 1 ♂, xii.1957 (*J. V. Leroy*); N. Kivu, riv. Kabarazo, 1 ♂, 12.v.36 (*L. Lippens*); Rutshuru, 1 ♂, 26.iv.36 (*L. Lippens*); Rutshuru, 1 ♂, 1 ♀, 19.iv.36 (*L. Lippens*); Rutshuru, 1 ♂, 1 ♀, 10.v.36 (*L. Lippens*); Rutshuru, 1 ♀, 11.v.36 (*L. Lippens*); Rutshuru, 2 ♀, 25.v.36 (*L. Lippens*). TANZANIA: Bundiki, Uluguru Mts., moy. Mgetu, 1,300 m., 1 ♀, 30.iv.-11.v.1967 (*P. Basilewsky* and *N. Leleup*).

Specimens from West Africa have wider frontal shiny areas, niveous spots obviously nearer orbits, tarsi paler, some brown on pleura.



***Paralimna (Paralimna) basilewskyi* Soika**

(Text-fig. 64)

*Paralimna basilewskyi* Soika, 1956a : 497.Differs from *Paralimna pupulata* Cresson, as follows:

Small size, antennal arista pale, head colour generally shining blackish brown, vertex with a little brown dusting around ocelli. Lower half of face very lightly dusted with silver-white. Frons anterior to front bristles velvet-black with niveous spot close to the base of each antenna, raised area between the spots rugulose. Fronto-orbital bristles very reduced. Epistome strongly white dusted. Buccae golden brown dusted. One strong facial, three to four reduced bristles.

*Thorax* and scutellum of similar colour to *Paralimna pupulata*.*Legs* with pale tarsi, rest dark brown. Fore femora of male with a series of short, well spaced, flattened setae on anteroventral face.*Wings* with membrane and veins pale yellowish brown.*Abdomen* strongly dusted with dark orange-brown, narrow incomplete grey-green fasciae on segments three and four only.

Genitalia (Text-fig. 64).

♀ larger in size with better developed grey fasciated pattern on abdomen, and middle frons more strongly crenulate.

I have seen only the type male and four further specimens from the Congo and British Cameroons.

Material studied. CAMEROONS: Ngusi, 1 ♂, 4.xi.1949 (*H. Oldroyd*), and two further specimens. CONGO: Kamogobe (Sud Masisi), 1 ♀, 4.iii.36 (*L. Lippens*); Bassin Lukuga, 1 ♂, 1935 (*H. de Saeger*).The *ALBONOTATA*-species group

Characterized by the flattened white area on the second antennal segment, and the strongly projecting face and frons.

***Paralimna (Paralimna) albonotata* Loew**

(Text-figs. 39, 49, 72)

*Paralimna albonotata* Loew, 1862 : 13.*Paralimna albonotata* Loew; Cresson, 1929 : 191.*Paralimna albonotata* Loew; Cresson, 1947 : 113.*Paralimna albonotata* Loew; Wirth, 1956 : 383.*Paralimna albonotata* Loew; Soika, 1956a : 494.*Paralimna albonotata* Loew; Wirth, 1960 : 394.

Not easily confused with any other Ethiopian species providing that the antennae are considered, due to the silver-white flattened area on the second antennal segment. This species is not closely related to any other Ethiopian species but to the pre-

dominantly Oriental species groups which bear nival spots on the second segment and have the fronto-orbital angles patterned with velvety black and yellow.

The Ethiopian distribution of this species from the southern and eastern regions may suggest that it has been introduced from the east. It has not, however, been recorded from Madagascar nor the Seychelle Islands.

A large species with the following characters:

*Head*: antennae black, arista with eleven to twelve lateral hairs. Interfoveal carina golden, becoming grey, face grey with variable amounts of golden dust producing a distinct yellow tinge in some specimens. Two to four strong facials plus eight to ten short hairs in facial series. Buccae broad and grey, with only two to three small bristles plus a short and weak buccal bristle. Frons predominantly brown with some yellowish grey dusting. The area of the mesofrons, which is raised in the *confluens* species group, is obvious, but not raised in any way. The fronto-orbital angles are velvety black, delimited by grey. Fronto-orbital bristles strong.

*Thorax*: mesonotum buff-brown strongly irrorate and with two dark brown vittae between the dorsocentrals. Pleura predominantly grey.

*Legs*: tarsi pale, remainder of legs dark with dense grey dusting. Male fore femora with a weak series of anteroventral bristles, only slightly flattened and present only over the basal three quarters.

*Wings* hyaline, veins brown.

*Abdomen*: the brown fasciae marked and the grey fasciae incomplete on all but segment two, and divided in the mid line by a brown vitta.

♂ genitalia (Text-figs. 49, 72). Males generally smaller and more brown, with smaller eyes and weaker facials.

Material studied. SOUTH AFRICA: Zululand, Nagara Res. Lab., 3 ♂, 1 ♀, 1922 (*H. H. Curson*); Lr. Umfolosi Riv., 10 ♂, 15 ♀, 1922 (*H. H. Curson*); Natal, Weenen, 2 ♂, 2 ♀, xi.25 (*H. P. Thomasset*); E. Cape Prov., Kathberg, 4,000 ft., 1 ♂, 1 ♀, x.1932 (*R. E. Turner*); Orange F. State, Harrismith, 1 ♂, 1 ♀, 1-20.iii.1927; Natal, Estcourt, 1 ♀, viii-ix.1896 (*G. A. K. Marshall*); Mafeking, 1 ♂, 27.ii.1934 (*J. Ogilvie*); Basutoland, Maseru District, 5 ♂, 7 ♀, 4-13.i.63 (*B. & P. Stuckenberg*), Valley floor, old lands, 5,500 ft; Transvaal, Nelspruit, 2 ♀, xi.59 (*B. Stuckenberg*); Natal, Ahrens District, Nr. Lilani, 1 ♂, iv.62 (*B. & P. Stuckenberg*); E. Cape Prov., Barkly East Dist. LundeansNek., 1,925-2,100 m., 1 ♂, 1 ♀, 18.i.63 (*B. & P. Stuckenberg*); Basutoland, Maseru District, Maloti Mts., Bushmans Pass, 1 ♀, 8-14.i.63 (*B. & P. Stuckenberg*); Natal, Newcastle, 1 ♀, xii.1952; Pirie Forest, E.P., 4 ♀, 10.iii.53 (*B. Stuckenberg*); Natal, St. Helier Est., Nr. Hillcrest, 2 ♀, 20.xii.1954 (*B. Stuckenberg*); Grahamstown, 3 ♂, 7 ♀, 7.xii.52 (*B. Stuckenberg*), present in large numbers on mud in a dried up water hole; Pondoland, Bizana Dist., Umzamba mouth, 1 ♀, 25.xi.60 (*B. & P. Stuckenberg*); Natal, Umzimkulwana Valley, Orbi Gorge Reserve, 1 ♀, 21-28.xi.60 (*B. & P. Stuckenberg*). KENYA: Emali Range, 4,900 ft.-5,900 ft., 4 ♂, 1 ♀, ii.40 (*Sultan Hamud*).

#### The WIRTHI-species group

A single Ethiopian species most closely related to *Paralimna picta* Kertész. Both male and female have strong fore femoral armature, strongly spinose in the former.

*Paralimna (Paralimna) wirthi* sp. n.

(Text-fig. 69)

A small slate grey and brown species, not closely allied to any other Ethiopian species, but showing most affinities to the Oriental *Paralimna picta* Kertész.

♂. *Head*: antennal segments I and II black, segment III grey with white pubescence. Arista with thirteen lateral hairs. Face slate-grey, rather sparsely pollinated medially, epistoma pale grey and interantennal carina golden dusted. One long curved facial and series of six to ten becoming progressively shorter and weaker. Palpi dark with grey dusting. Buccae pale grey with one strong porrect bristle and a few relatively strong setae. Frons uniformly dark brown, two dark blue-grey patches posterior to frontal suture. Frontal bristle inserted posterior to anterior fronto-orbital. Lower frons with numerous small curved hairs, parafacial and orbital strips around eye pale grey up to level of antennae.

*Thorax*: dark brown with two interrupted yellowish brown vittae along line of dorsocentrals. Laterally on mesonotum more erratic vittae and patches. Scutellum dark brown dorsally, grey at base laterally, apically brown. Dorsal margins of notopleuron etched in iridescent green. Dorsal third of mesopleuron brown grading into blue-grey on lower half. Remainder of pleura blue-grey. Halteres reddish yellow basally, club yellow.

*Legs*: fore legs, coxae and femora grey, latter with an anteroventral row of short slightly curved and flattened bristles and a ventral and posteroventral rows of longer, equal to width of femur, distinctly pointed and closely set bristles. Tibia dark brown, paler apically. Tarsi reddish brown, ventrally with a golden brush of setae. Middle and hind legs, femora blue-grey laterally, dark brown dorsally, tibiae and mid tarsi dark, while hind tarsi are pale.

*Wings* uniformly lightly infumated.

*Abdomen*: grey fasciae narrow and only on segment five do they extend more than one third the width of the segment.

♂ genitalia (Text-fig. 69).

♀, with the exception of fore femoral armature, very similar to male.

Holotype ♂. LIBERIA: Cape Mount Co., Dia-Sandy bank, 17-25.ii.53 (*C. Blickenstaff*), to U.S.N.M.

Paratypes. 8 ♂, 4 ♀ (*C. Blickenstaff*), U.S.N.M., from same locality. 2 ♂, 1 ♀ to B.M.(N.H.).

[*Paralimna fulvipes* Bezzi]

*Paralimna fulvipes* Bezzi, 1908 : 387.

I have studied the type specimen in the Institute Royale des Sciences Naturelles, Brussels, and the specimen belongs to the genus *Hydrellia* **comb. n.** It is in very poor condition, with the antennae missing and the complete body covered in Lepidopteran scales.

*Species Incerta*

*Paralimna dasycera* Bezzi, 1908 : 108.

I have been unable to study the type of this species, but I suspect that it is conspecific with *P. arabica nubifer* Cresson. If this is the case it will have precedence over *P. arabica* and the latter will be relegated to synonymy.

**OEDENOPS** Becker

*Oedenops* Becker, 1903 : 178.

Type-species, *O. isis* Becker (mon.)

Erected by Becker (1908) to receive the species *Oedenops isis* Becker, characterized by small size, vertical face with prominent interfoveal protuberance and sexual dimorphism in colouration of head and thorax (Text-fig. 16), almost total lack of mesonotal setulae and, in Ethiopian species, the absence of sternopleural bristles. The latter character is not consistent in other geographical regions, and undescribed species from the Orient and Australia may have sternopleural bristles present, often differing between sexes of the same species. Great similarity in body form and colour may be seen between *Oedenops* and the rather aberrant new subgenus of *Paralimna*, *Oedenopiforma*. In the Ethiopian region as here delimited only three species are known to occur, and one, *Oedenops isis* Becker, described from Egypt, and not previously recorded from any other locality, is here recorded from Madagascar.

The male genitalia are of the typical Notiphiline pattern; the outer claspers are lightly fused medially and densely bristled. The aedeagus is simple, with a membranous penis and small parameres. The cerci are partially fused ventrally to the external claspers (Text-fig. 92). The species appear to have an Eastern distribution in the Ethiopian region, only reported, at present, from N.E. Africa, S.E. Africa and Madagascar, although being of rather cryptic habit are probably not often collected.

A key to the four species at present described in this genus is provided.

KEY TO SPECIES OF *OEDENOPS*

- |   |  |  |
|---|--|--|
| 1 | Antennae dark grey or black in both sexes, presutural bristle present . . . . .  | 3  |
| — | Antennae pale yellow in both sexes, presutural bristle absent . . . . .  | 2  |
| 2 | Male frons and dorsal facial region deep reddish brown; female with dark brown dusting on mesonotum sparse and confined to area between dorsocentral bristles, face grey . . . . .   | <i>aurantiacus</i> Soika (Madagascar) (p. 354)     |
| — | Male frons and dorsal facial region yellow; female, dense dark brown dusting on mesonotum, not confined to area between the dorsocentrals  | <i>isis</i> Becker (Egypt and Madagascar) (p. 355) |
| 3 | Male frons and dorsal facial region reddish brown, cheeks golden, female frons, buccae and face, especially latter, greyish yellow, two hairlike bristles to facial series . . . . . | <i>nudus</i> Coquillet (N. America)                |
| — | Male frons and face brown, cheeks silvery white; female with face and buccae, particularly latter, silver-grey, three hairlike bristles to facial series                             | <i>afra</i> Wirth (S. Africa) (p. 355)             |

***Oedenops aurentiacus*** Soika

(Text-figs. 16, 92)

*Oedenops aurentiacus* Soika, 1956b : 123.

This species is of most striking appearance, the male possessing a frons and dorsal facial region of intense reddish brown colour and of velvet texture, which characters, together with the pale antennae and legs, distinguish it from all other described

species. Although I have not been able to see the type specimen, the latter still being in the possession of Soika, I am convinced that the original description was based on the male and not the female as stated.

♂. *Head*: frons apart from lateral orbital strips reddish brown velvet, vertex silvery grey, becoming yellow on orbital strips. Antennae pale, arista dark brown with four to five lateral hairs. Face reddish brown dorsally becoming bright golden yellow ventrally. Facial series of two short, weak, hairlike bristles. Buccae broad, pale golden yellow becoming grey posteriorly, buccal bristle weak, no scattered setulae, although two to three weak hairs inserted along ventral edge. Palpi pale.

*Thorax*: mesonotum grey, with the area between the dorsocentrals lightly dusted with yellow and extending on to scutellum, a few minute setulae between dorsocentrals and lateral to them. Pro-, meso- and pteropleura yellow, becoming grey ventrally. Posterior mesopleural bristles very short and weak. Sternopleuron grey with very light yellow dusting.

*Legs* pale, with some grey dusting on the base of the fore and mid femora, hind femora predominantly grey. The apical segments of tarsi slightly darkened. Mid femur with a postero-ventral row of short curved bristles on the apical half.

*Wings* with hyaline membrane with slight milkiness on and around anal lobe. Veins pale brown. Halteres, reddish yellow on stem with white club.

*Abdomen*: grey without brown dusting and clothed in numerous short pale hairs. External claspers as Text-figure 92.

Length, 2-2.5 mm.

♀. Almost totally grey, with slight yellow dusting on frons and face, and yellow-brown dusting between the dorsocentrals of the mesonotum. All femora with more extensive grey dusting than male. Mid femur without the male comb of bristles.

Material studied. MADAGASCAR: Sud-Est, Sainte Luco, 10 m., dct. Fort Dauphin, 1 ♂, 1 ♀, 22-24.ii.58 (*B. Stuckenberg*); Fenerive, lagoon shore, 1 ♂, 1 ♀, xii.55 (*B. Stuckenberg*).

### *Oedenops afra* Wirth

*Oedenops afra* Wirth, 1956 : 387.

The presence of a presutural bristle and dark antennae easily distinguishes this from the other Ethiopian species in the genus. The sternopleuron bears a short, weak hair which appears to represent the reduced sternopleural bristle present in *Paralimna*.

I have seen only one specimen and can add little to Wirth's description, apart from the above comments on the presutural bristle and sternopleural hair.

SOUTH AFRICA: Port St. Johns, 1 ♀, 20-25.xii.1961 (*B. & P. Stuckenberg*).

### *Oedenops isis* Becker

(Text-fig. 96)

*Oedenops isis* Becker, 1903 : 178.

*Oedenops nuda* Coquillet; Cresson, 1929 : 183.

*Oedenops isis* Becker; Cresson, 1946 : 229.

*Oedenops isis* Becker; Cresson, 1947 : 108.

Apart from the original locality in Egypt and Cresson's reference to Sudanese specimens (Cresson, 1947 : 108), I can trace no other localities for this species. This fact makes the present recording of *Oedenops isis* from Madagascar seem unlikely and as the only specimen of *Oedenops isis* I have seen is the rather damaged female

type, it may be that the Malagasy specimens are a new, closely related species. The following brief description is from a male of the Malagasy series.

♂. *Head*: antennae totally reddish yellow, arista dark with four to five lateral hairs. Face and frons an intense orange-yellow. Buccae greyish yellow. Only one short and weak bristle in facial series, and one bristle of similar size on the bucca. Both fronto-orbital bristles are present as very short bristles. Vertex greyish yellow with strong vertical, frontal and ocellar bristles. The postocular series very slight.

*Thorax*: metanotum grey with pale yellow dusting between the dorsocentrals. There are a few scattered setulae laterally on the mesonotum and a number of slightly longer hairs on the scutellum. The presutural bristle is lacking. Scutellum grey, yellow dusted on disc. Mesopleuron yellow, remainder of pleura grey. Mesopleuron with three to four weak hairlike bristles on the posterior edge.

*Wing*, membrane translucent, with pale brown veins.

*Legs*, pale with grey dusting on the coxae and tarsi, and the middle and hind femora. There is a row of tiny spines along the apical half of the anteroventral face of the fore femora.

*Abdomen*: totally grey with a short sparse pubescence.

Male genitalia as in Text-fig. 96.

♀ very similar to male, frons less intense orange-yellow, but mesonotum with darker orange-yellow dusting between the dorsocentrals and on humeral region.

Easily distinguished from *Oedenops aurantiacus* Soika by the lack of a reddish brown velvety frons in the male and the yellow face and frons instead of grey in the female.

Material studied. MADAGASCAR, Sud-Est: Sainfo-Luce, 10 m., dct. Fort Dauphin, 2 ♂, 22-24.ii.58 (*B. Stuckenberg*); Sud-Ouest, Saint-Augustin, 6 m., dct. Tuléar, 1 ♀, 11-13.ii.58 (*B. Stuckenberg*); Fenerive, Lagoon shore, 1 ♀, xii.1955 (*B. Stuckenberg*).

### KAREMA Cresson

Type-species, *Karema loewella* Cresson 1929 : 182. By orig. des.

A distinctive genus, known up to the present from the type-species alone. Apparently common throughout eastern and southern Africa and Madagascar (*K. flavipes* sp. n.). Easily distinguished from other Notiphiline genera by the following: dorsocentral, presutural and posterior notopleural bristles absent, ocellars and sternopleural reduced. Suggested by Cresson as a connectant between *Paralimna* and *Dryxo*, a suggestion I would endorse.

The genitalia are large and relatively complex, the external claspers are small, articulated with the epandrium in the normal fashion and also to a sclerotized ventral portion of the epandrial membrane. The aedeagus is large, the inner claspers loosely attached and variable in shape, the hypandrium well developed, partially sclerotized, and with strongly sclerotized projections (Text-fig. 91).

#### KEY TO SPECIES OF *KAREMA* CRESSON

- 1 All legs predominantly dark, the mid-femora totally grey dusted  
*loewella* Cresson (p. 357)
- All legs predominantly pale, reddish yellow, mid-femora totally pale  
*flavipes* sp. n. (p. 357)

*Karema loewella* Cresson

(Text-fig. 90)

*Karema loewella* Cresson, 1929 : 182.

Easily distinguished from *Karema flavipes* by darker legs, almost totally black, silver-grey mesopleuron and darker and less vittate mesonotum. The basal scutellar bristles are nearer the apical bristles and situated on the brown apical area of the scutellum. The brown abdominal fasciae extend over the anterior half of segments three to five only.

♂ and ♀: description as for *Karema flavipes* sp. n., but differs in the following manner:

*Head*: antennae dark, segment III with pale pubescence. Arista with thirteen lateral hairs. Face grey pollinose with considerable golden dust overlying. Buccae grey, golden dusting anteriorly and brown dusting posteriorly. Facial series of very weak hairs, with only one obvious member. One to two long weak buccal bristles and numerous weak hairs ventrally. Frons black medially, very lightly dusted with grey and brown.

*Thorax*: black, lightly dusted with brown dorsally, silver-grey laterally with some golden dusting on the mesopleuron, vittae of grey dusting usually obscure, except on some East African specimens. Scutellum dark brown, silver-grey basally on sides. Both pairs of scutellar bristles inserted in the brown apical area.

Coxae silver-grey and all tarsi slightly paler than rest of legs which are dark, often totally black. Dorsal face of tibiae and tarsi with at least some silver-grey dusting.

*Wings*, veins pale reddish yellow, membrane lightly infumated.

*Abdomen*: grey, with brown fasciae on anterior half of segments three to five and considerable brown dusting on segment one.

Aedeagus as Text-figure 90.

Material studied. MALAWI: Cholo, 1 ♂, 1 ♀ (*R. C. Wood*). SUDAN: W. Darfur, Jebel Marra, Killing, 7,000 ft., 1 ♂, 7.iv.1932 (*M. Steele*). NIGERIA: Zungeru, 4 ♂, 2 ♀, 4.iii.1911 (*J. W. S. Macfie*); Zungeru, 2 ♀, 15.iii.1911 (*J. W. S. Macfie*); Zungeru, 4 ♂, 23.ii.1911 (*J. W. S. Macfie*). SOUTH AFRICA: Zululand, Lr. Umfolosi Riv., 4 ♀, 1922 (*H. H. Curson*); Natal, Durban, 1 ♂, 26.iv.19 (*C. N. Barker*); Transvaal, Waterberg dct., 1 ♂, viii.48 (*O. Beyer*). CHAD: W. Goulem, 1 ♂, 8-9.x.58 (*G. B. Popov*). TANZANIA: Bukoba, 1 ♂, 10.iv.1912 (*C. C. Gowdey*). RHODESIA: L. Lundi River, Chipinda Pools, 1 ♀, 22.x.60 (*R. Goodier*).

*Karema flavipes* sp. n.

(Text-figs. 10, 91)

Closely related to the mainland species but easily distinguished from it by its pale legs, the mid-femora being totally reddish yellow.

♂. *Head*: antennal segment II strongly silvered, arista with fourteen lateral hairs. Facial series approximately twelve hairs, with one slightly stronger member. Face strongly gold dusted, broader, less sharply carinate than *Karema loewella* Cresson. Mid-frons dark blackish brown. Pre-ocellar bristles strong, projecting beyond anterior edge of frons. Fronto-orbital bristles, one pair, strong, five to six short weak, hairlike bristles along orbital edge. Vertical bristles also strong, hairs in position of 'posterior verticals'.

*Thorax*: mesonotum, ground colour pale golden brown with grey laterally; two narrow brown median vittae, two broader interrupted brown vittae, interrupted at suture running laterally along line of dorsocentrals, the latter visible as weak hairlike bristles. Vittae broaden and fuse posteriorly. Pleura grey, posterior part of mesopleuron with strong golden sheen. One strong posterior mesopleural bristle, one weak sternopleural bristle and a median oblique line of hairs. Scutellum brown at apex, silver laterally, golden medianly on disc.

*Legs* pale apart from some dark dusting on fore and hind femora, apices of tibiae and last tarsal segments. Coxae silver. Relatively long hairs on fore femora.

*Abdomen*: abdominal segment one grey laterally, segment two with brown fascia interrupted laterally and medianly by silver-grey. Segments three and four grey, very narrow medially, broadening laterally. Segment five totally dark brown.

♂ genitalia as Text-figure 91.

Holotype ♂. MADAGASCAR: Est, Ambodivoangy, 20 m., dct. Maroansetra, 16-20.iii.58 (*B. Stuckenberg*), to N.M.

Paratypes. Same data as type, 1 ♂, 3 ♀. MADAGASCAR: Ouest, Ranohira, 860 m., 3 ♂ 7 ♀, 26.i-4.ii.58 (*B. Stuckenberg*); Est, Ivontaka, dct. Manara, 3 ♂, 5 ♀, 10-14.iii.58 (*B. Stuckenberg*); Sud, Sept Lacs, 100 m., dct. Tuléar, 4 ♂, 1 ♀, 13-16.ii.58 (*B. Stuckenberg*); Ranomafana, 1 ♀, xii.1955 (*B. Stuckenberg*); Est, Navana-Antongil, 6 m., dct. Maroansetra, 1 ♀, 20-25.iii.58 (*B. Stuckenberg*); Sambirano, Lokobe, Nossi-Bé, 6 m., 2 ♀, 9-23.xi.57 (*B. Stuckenberg*); Est, Sahasoa, Fanpan-ambo, 80 m., dct. Maroansetra, 1 ♂, 1 ♀, 26-29.iii.58 (*B. Stuckenberg*); Betroka, 1 ♂, 1.viii.48 (*A.R.*); Route to Majunga, Km. 530, 1 ♀, (*R.P.*).

Paratypes to N.M., apart from eight to B.M.(N.H.).

### **DRYXO** Robineau-Desvoidy

Type-species, *Dryxo lispoidea* Robineau-Desvoidy, 1830 : 787. By monotypy. (Emend. from *lispoidea*).

This genus contains the largest, in body size, of the known Ephydrids, and superficially does not appear to agree with the tribal diagnosis.

The genus is characterized by its large size, greater than 1 cm., and long legs, those of the male bearing long tarsal hairs. The frons is flat and protruding with reduced setation, only the vertical and postocellar bristles strongly developed. Face large with the facial series reduced or absent. Antennae and arista shortened, the latter always pale in Ethiopian species. One notopleural bristle inserted posteriorly and in two of the three species from this region there are a pair of posterior dorsocentral bristles. Middle tibiae with three short dorsal spines, two closely inserted basally, the third subapically. The wings have the costa extending to the fourth longitudinal vein, and the subcostal vein bears long ventral hairs at least on the node below the humeral cross vein, and usually along its length.

Only two previously described Ethiopian species, a third from Madagascar is described here. Very widespread in distribution and recorded from practically the whole of the region, including the Canary Islands. Genitalia of male basically similar to other members of the tribe, the aedeagus is large with complex parameric structures. The external claspers are large and supported by sclerotisation of the ventral edge of the epandrium (Text-fig. 93).



KEY TO THE ETHIOPIAN SPECIES OF *DRYXO* ROBINEAU-DESVOIDY

- 1 Head, thorax and abdomen uniformly buff-brown pollinose, lacking a facial series and with a strong pair of prescutellar dorsocentral bristles . . . . . **woodi** Cresson (p. 362)
- Head, thorax and abdomen not uniformly buff-brown, facial series of hairlike bristles present, and dorsocentrals weak or absent . . . . . 2
- 2 Humeral bristle absent; fifth abdominal segment totally dark, usually one pair of very weak and short prescutellar dorsocentrals . . . . . **margaretæ** sp. n. (p. 360)
- Humeral bristle present; fifth abdominal segment not totally dark brown, usually no trace of prescutellar dorsocentrals . . . . . **ornata** Macquart (p. 359)

***Dryxo ornata*** (Macquart)

(Text-fig. 93)

*Blepharitarsis ornatus* Macquart, 1843 : 411.*Corythophora longipes* Loew, 1862 : 13.*Dryxo ornata* (Macquart) Bezzi, 1908 : 194.*Dryxo ornata* (Macquart); Cresson, 1929 : 181.*Dryxo ornata* (Macquart); Soika, 1956a*Dryxo ornata* (Macquart); Wirth, 1960 : 393.

A widespread species of highly variable size and colour. Specimens from the Arabian peninsular being paler, more grey with the dorsal abdominal pattern less distinct, the darker fasciæ reduced. Material from central Ethiopian regions are invariably darker with wings lightly infumated.

Easily distinguished from the other African species by the characters given in the key, namely the presence of a humeral bristle, and a fasciated abdominal pattern, and the absence of any sign of dorsocentral bristles.

♂. *Head*: antennæ dark, segments I and II with grey dusting. Arista pale with fourteen to sixteen lateral hairs, apparently in two rows. Face, parafacial region, and buccæ silver-grey, 'eye stripe' dark brown. Frons pale golden yellow, slightly darker on the vertex. Facial series of five or six weak but relatively long hairlike bristles plus a ventral extension of numerous weak hairs. Buccal bristle short.

*Thorax*: predominantly grey, extensive irroration of the mesonotum with dark brown, the scutellum being dark brown latero-apically. There is rarely any indication of the posterior pair of dorsocentral bristles.

*Legs* pale with varying amounts of grey dusting, especially on the fore femora and coxæ. Hind first and second tarsal segments with long dorsal black hairs.

*Wings*, membrane hyaline, veins pale brown. The first subcostal section has a ventral row of long hairs, while the dorsal surface of the first longitudinal vein carries a number of short, widely spaced, curved bristles along its second section. The lower calyptæ are well developed and fringed with dense long white hairs. The haltere club is yellow.

*Abdomen*: predominantly grey, with varying amounts of brown depending on the geographical region. The brown fasciæ reach their largest size in specimens from Eastern and Central Africa. Segment two has only small lateral brown areas, the latter bearing long bristles.

♂ claspers as Text-fig. 93.

Material studied. CONGO: L. Tanganyika, Luebe, Nr. Baraka, 2 ex., 3I, 20. iv. 27 (R. Bois); L.S.T.M. CONGO FREE STATE: Matadi, 2 ex., 18. xi. 1903 (Dutton, Todd and Christy). NIGERIA: Ilorin, 29 ex., 2I. ii. 1912 (J. W. S. Macfie); Alagua,

5 ex., 1912 (*J. W. S. Macfie*); Zungeru, 80 ex., ii. 1912 (*J. W. S. Macfie*). SIERRA LEONE: Kaniki, 2 ex., 22.v. 1912 (*J. J. Simpson*); Kayima, 1 ex., 29.vi. 1912 (*J. J. Simpson*); Lungi, 1 ex., 14.vii. 1959 (*C. P. Hoyt*). GHANA: N. Territories, Yapi, 21 ex., iii. 1916 (*J. J. Simpson*); Kpong, 1 ex., iv. 1922 (*J. W. S. Macfie*); Koforidua, 2 ex., iv. 1921 (*J. F. Corson*). CHAD: W. Goulem, 1 ex., 8-9.x.58 (*G. B. Popov*). W. ADEN PROT.: Jebel Harir, 5,200 ft., 4 ex., 26.x-6.xi. 1937. SOMALIA: Hargeisa, 2 ex., v. 1949 (*K. M. Guichard*); Bohotle, 2 ex., 1903 (*A. F. Appleton*). SUDAN: W. Darfur, Jebel Marra, Killing, 7,000 ft., 3 ex., 7.iv. 1932 (*M. Steele*). S. W. AFRICA: Satansplatz, 1,300 m., 1 ex., 17-18.xii. 1933 (*K. Jordan*). MALAWI: Central Angoniland, 6 ex. (*R. Limpembe*); Kota Kota, 2 ex., 13.ix. 1919 (*W. A. Lamborn*); Cholo, 6 ex. (*R. C. Wood*); Lake shore, 1 ex., 4.viii. 1909 (*J. B. Davey*); Chisi, Nr. Nkata Bay, 1 ex., 15.x. 1908 (*J. B. Davey*). ZAMBIA: Kaful, 1 ex., 1.ix. 13 (*R. C. Wood*); Luangwa Valley, 1 ex., 17.ix. 1910 (*M. Juwia*). TANZANIA: T. Kigoma, 1 ex., 31.viii. 1931 (*J. Ogilvie*); Bukoba, 8 ex., 10.vi. 1912 (*C. C. Gowdey*); Old Shinyanga, 4 ex., 29.x.52 (*E. Burt*); Zanzibar, Chukusani, 1 ex., 12.ix. 11 (*W. M. Adero*). KENYA: Tana Bridge, 9 ex., 1-2.vii.48; Voi, 1,800 ft., 1 ex., 21-23.iii. 1911 (*S. A. Neave*). RHODESIA: Lower Lundi, Chipinda Pools, 7 ex., 22.x. 1960 (*R. Goodier*). UGANDA: Entebbe, 24 ex., 16.vi. 1912 (*C. C. Gowdey*); 3 ex., 1903 (*D. Bruce*); Ruwenzori Range, Kilembe, 4,500 ft., 1 ex., xii. 1934-i. 1935 (*F. W. Edwards*).

### *Dryxo margaretae* sp. n.

(Text-figs. 15, 94)

Very closely related to *Dryxo ornata*, differing most noticeably in abdominal pattern but also lacking the humeral bristle (in the manner of *Cyphops*).

The following description refers only to points of comparison between this species and *Dryxo ornata*.

Antennae more grey dusted, facial series of hairs slightly shorter (Text-fig. 15). Vertex more strongly marked with orange-brown, orbital bristles stronger. Humeral bristle absent, notopleural bristle more posterior, two short hairs on posterior edge of notopleuron. Weak bristles on posterior edge of mesopleuron, stronger than in *Dryxo ornata*. Grey area at base of scutellum larger and bare of setulae, grey apical area less obvious. All legs darker, grey dusting denser, long black hairs on hind metatarsi, only arising from apex of segment not apical half.

*Abdomen*, segment one totally grey, segment two brown fasciae interrupted in the middle by broad grey area. Segments three and four grey only laterally, dark brown and shining over majority of segment. Small grey area in middle of segment on anterior edge, grey area bare of setulae. Segment five reversed situation, grey anteriorly and brown posteriorly.

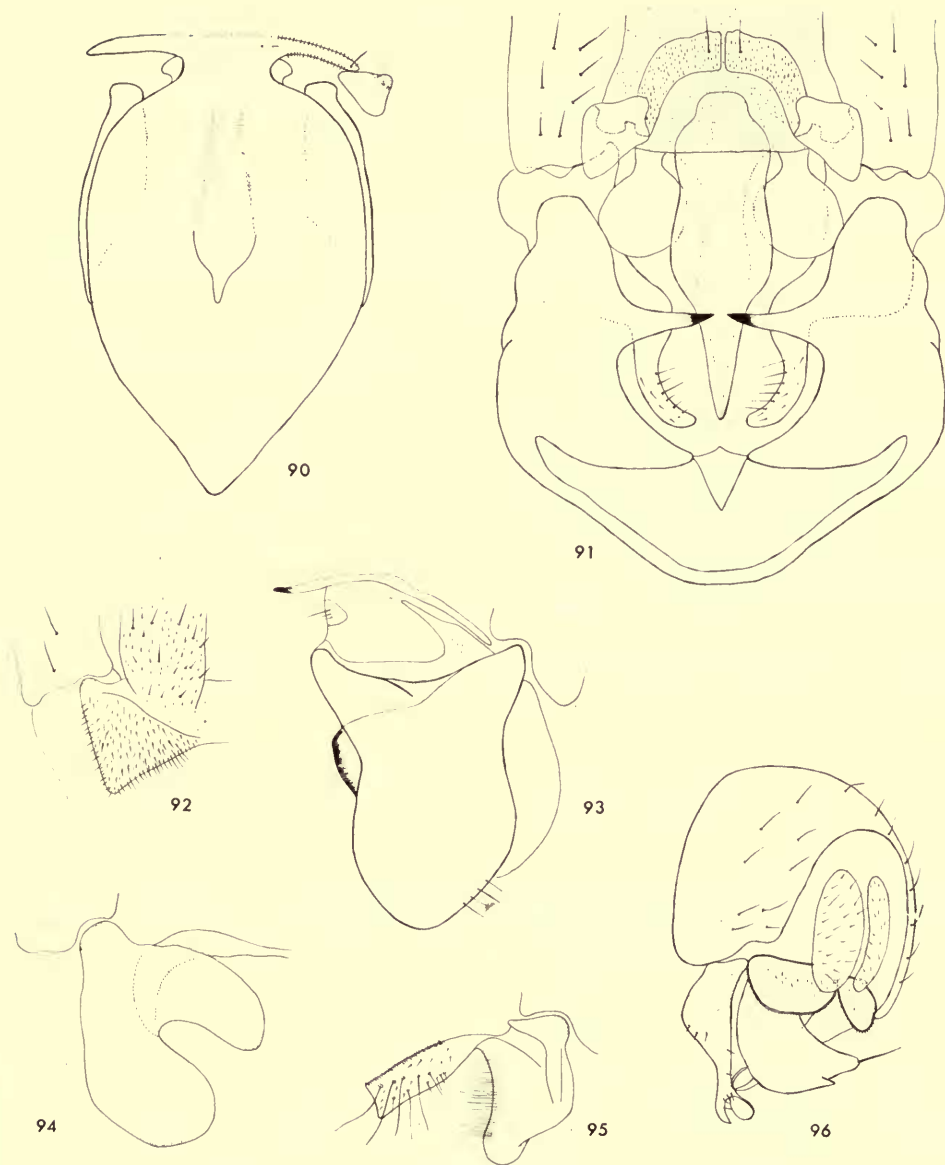
Male external claspers as Text-figure 94.

Material studied. Holotype ♂. MADAGASCAR: Est, Sakasoia Fampanambo, 80 m., dct. Maroanetra, 26-29.iii.58 (*B. Stuckenberg*), to N.M.

Paratypes. 1 ♂, 1 ♀ as above.

MADAGASCAR: Perinet, 2 ♂, xii. 1955 (*B. Stuckenberg*); Moramanga Dist., Niagarakely Forest, 1 ♀, xii. 1955 (*B. Stuckenberg*).

One male and one female paratype to B.M.(N.H.).



FIGS. 90-96. 90, *Karema loewella* Cresson, aedeagus; 91, *K. flavipes* sp. n., hypandrium and associated structures; 92-95, ♂ external claspers: 92, *Oedenops aurantiacus* Soika; 93, *Dryxo ornata* Macquart; 94, *D. margaretae* sp. n.; 95, *D. woodi* Cresson; 96, *Oedenops isis* Becker, ventro-lateral view of ♂ genitalia.

*Dryxo woodi* Cresson

(Text-fig. 95)

*Dryxo woodi* Cresson, 1936 : 266.

Easily distinguished species possessing buff coloured vestiture and completely pale legs, the facial series and sternopleural fan of hairs are very reduced.

♂ and ♀. *Head*: antennal segments I and II pale with very short dorsal spine, segment III grey dusted and darker. Arista pale with twelve to thirteen lateral hairs. Face, parafacials and buccae whitish grey with some pale brown dusting. Facial series and buccal bristles reduced to very fine hairs. Frons uniformly setulose, with some indications of stronger setae in position of pre-ocellars, postocellars and orbitals. Vertical bristles short but strong. Pale grey anteriorly to pale brown posteriorly, para-orbital strips grey.

*Thorax*: mesonotum grey, anteriorly pale brown on humeri and becoming darker posteriorly. Humeral, pre-alar, supra-alar, prescutellar and four scutellar bristles present. General covering of mesonotal setulae, occasionally stronger in positions of reduced dorsocentrals. Two areas bare of setulae flanking the anterior third of acrostichal region. Mesopleurae grey, brown dusting only in anterior dorsal corner of mesopleuron and just ventral to wing attachment. Sternopleuron with dorsal fan of weak hairs.

*Legs* totally pale reddish yellow with general light, white dusting. No long hind metatarsal hairs.

*Wings* with hyaline membrane and pale veins. First vein bare dorsally and with very reduced white hairs ventrally.

♂ genitalia, external claspers as in Text-fig. 95.

Material studied. Only the original type series from Nyasaland.

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## APPENDIX

The following description was accidentally omitted from the copy submitted for publication. [Ed.]

***Notiphila (Notiphila) stuckenbergi* sp. n.**

(Text-figs. 13 and 24)

♂ and ♀. *Head*: Arista with ten lateral hairs. Face golden-yellow dusted, fading gradually to yellow-grey on cheeks, and to grey on post-buccal region. Facial carina rounded, broadening below, sloping strongly to oral margin. Ventral hairs on ant. seg. II half as long as on seg. III. Most dorsal of facial bristle-series long, weak, curved; second bristle long, hair-like, third strongest of series, but median gap between bristle-tips as wide as a single bristle-length; two weaker bristles up to mouth-margin. Buccal bristles separated by bare area from facial series, large lower buccal bristle about third of head-width. Post-buccal bristles short and closely adpressed, in few irregular rows, reducing to three and then one row above; one relatively long, four times length of buccal bristles; a weak hair projecting posteriorly from the extreme post-buccal region. Palpi white dorsally, to pale yellow ventro-basally; peristomum testaceous with light grey dusting. Fronto-orbital plates buff anteriorly at edges adjacent to eye, darker brown interiorly and posteriorly, five to six short very weak orbital hairs. Frons divided into two halves by a pale

brown band from ocellar hump to lunula; both halves dark brown, iridescent dark green when viewed at an angle. Fronto-orbital and verticals all long and strong; *vte* half length of *vii*. Anterior of the three pairs of post-ocellars relatively strong, about third length of pre-ocellars. Final bristles of post-orbital series three times length of others.

*Thorax*: All large bristles arising from brown irrorations, and *ph* from the brown lateral vittae. Thorax basically buff with very pale green undertones, with two pale rather indistinct brown vittae on mid-line, and a lateral irregular darker brown band from *ph* to base of scutellum. Notopleuron in dorsal half and thoracic suture dark brown, anterior bristle dark brown at base. Mesopleuron with a large central dark brown patch, olive-brown ground-colour as on mesonotum; wholly covered with short hairs. Pteropleuron with one long bristle and five to six short hairs. Metapleuron olive-brown. Scutellum coloured as thorax, with numerous weak hairs on disc and two slightly stronger on sides between apical and basal bristles; basal much longer than apical pair, latter crossing about halfway along their length.

*Legs*: Pale, only femora dark. Fore femur with eight to nine *pv* setae, relatively weak, longest equal to femoral depth; apical half with mini-spines, fringe of fine hairs along complete length, internal face uniformly hairy, a slightly silvered patch at middle. Metatarsal brush short and dark. Mid femur with four *av* spines, one strong; apical half with a strong black *pv* comb. Ventral tibial comb of short setae on apical half. Hind femur with two *a* bristles strong. Metatarsal comb black, longer than tibial width, consisting of three spines, with internal brush of yellow hairs, finally becoming black over lower half.

*Wings*: Only slightly infumated, veins yellowish red. Spines on basicosta before humeral break, wider than cell below; one spine at base and two before break stronger than others. First costal section haired, becoming stronger before costal break. Costal spines equal to costal width, ventral costal hairs greater than costal width. Second costal section twice third. Hind cross-vein almost wholly straight. Knob of halteres pale yellow, stalk red-yellow.

*Abdomen*: Ground-colour olive-brown with large brown fasciae just reaching ventral edge of middle tergites and so delimiting a narrow complete pale stripe. Abdominal hairs all long, bristles strong. Four long preapical bristles on hind tergite. Three pairs of long bristles on ventral edge of penultimate tergite, greater than width of last segment. Bristles of ventral surface with a converging pair on last segment.

Holotype ♂. MADAGASCAR: Sud, Route d'Anosibe, 840 m., dct. Moramanga, 18-21.xii.57 (*B. Stuckenberg*). To N.M.

Paratypes. [*F.K.* = *F. Keiser*; *B.S.* = *B. Stuckenberg*.] MADAGASCAR: data as holotype, 1 ♂, 1 ♀; Maj., Amboromalandy, 4 ♂, 2 ♀, 2.vii.58 (*F.K.*); Tam., Tamatave, 1 ♂, 1.xi.58 (*F.K.*); Fia., Mananjary, 1 ♂, 13.viii.58 (*F.K.*); Tan., Tananarive, 2 ♂, 4 ♀, 14.vii-1.ix.58 (*F.K.*); Maj., Amberovy, 10 ♂, 29.vi.58 (*F.K.*); Tam., Soanierana-Ivongo, 3 ♀, 6 and 8.xi.57 (*F.K.*); Tan., Mahatsinjo, 2 ♀, 12.vi.58 (*F.K.*); Tam., Perinet, 5 ♀, 22.ix-6.x.58 (*F.K.*), and 2 ♀, xii.55 (*B.S.*); Maj., Ambongamaranitra, 4 ♀, 20.vi.58 (*F.K.*); Fia., Ambatolahy, 1 ♀, 14.ix.58 (*F.K.*); Tam., Andranofotey, 1 ♀, 1.v.58 (*F.K.*); Fia., Ifanadiana, 1 ♀, 22.viii.58 (*F.K.*); Tam., Moramanga, 1 ♀, 20.xii.57 (*F.K.*), and Route d'Anosibe, 1 ♀, 18-24.xii.57 (*B.S.*); Tan., Ampefy, Lac Kavitaha, 1 ♀, 23.iii.58 (*F.K.*); Nord, Montagne d'Ambre, 1,000 m., dct. Diego Suarez, 2 ♂, 2 ♀, 23.xi-4.xii.57 (*B.S.*); Nord, Diego Suarez, 30 m., 1 ♀, 4-9.xii.57 (*B.S.*); Est, Ivontaka, 15 m., dct. Mananara, 5 ♂, 13 ♀, 10-14.iii.58 (*B.S.*); Est, Antanambe, 8 m., 3 ♀, 1.iv.58 (*B.S.*); Centre, Station Agric. Alaotra, 800 m., dct. Ambatondrazaka, 2 ♀, 24.xii.57 (*B.S.*); Ranomafana, 2 ♂, 3 ♀, xii.55 (*B.S.*); Sambirano, Lokobe, Nossi Bé, 6 m., 1 ♀, 9-23.xi.57 (*B.S.*); Fenerive, on beach, xii.55 (*B.S.*); Sandrangato, 1 ♂, 1 ♀ (Inst. Scient. Mad.); Maroantsetra, 1 ♀ (Inst. Scient. Mad.). N.M., N.M.B., B.M.(N.H.).

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